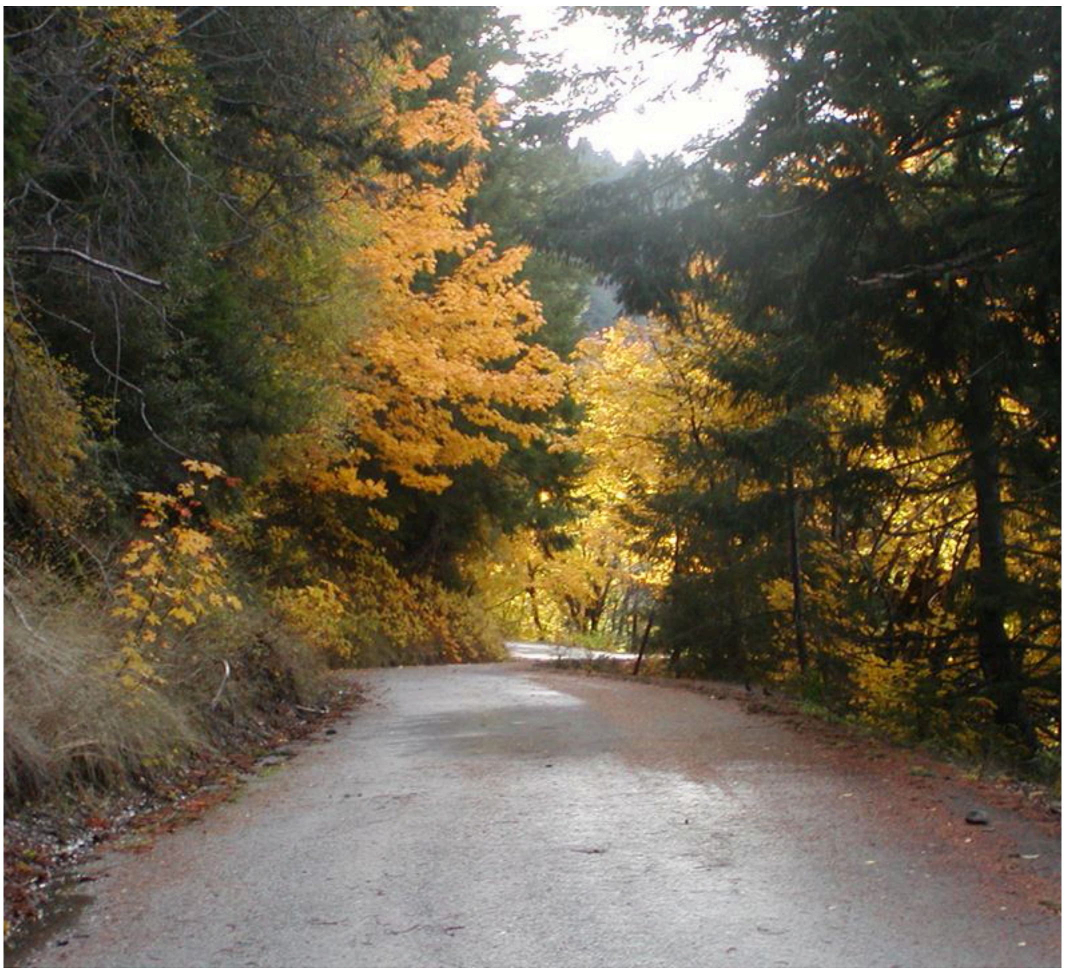
United States Department of Agriculture

Smith River National Recreation Area Restoration and Motorized Travel Management Project

Final Environmental Impact Statement



Forest Service	Six Rivers National Forest	Gasquet Ranger District	R5-MB-290b December 2016

Cover photo: Jawbone Road, Gasquet Ranger District/Smith River National Recreation Area, November 2014.

Smith River National Recreation Area Restoration and Motorized Travel Management

Final Environmental Impact Statement

Del Norte County, California

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Abstract: The USDA Forest Service, Gasquet Ranger District of the Six Rivers National Forest (SRNF) has prepared the *Smith River National Recreation Area Restoration and Motorized Travel Management Final Environmental Impact Statement* (FEIS) to disclose the environmental analysis of a proposal to more efficiently manage motorized use, while making changes and infrastructure improvements on select road segments on the NFTS and rectifying and restoring natural resources. This FEIS discloses a range of alternatives in compliance with the 2005 Travel Management Rule (36 CFR 212, Subparts A and B), including maintaining the current National Forest Transportation System (NFTS) within the Smith River National Recreation Area (Smith River NRA) as is (No Action – Alternative 1), and three action alternatives analyzed in detail (Alternatives 4, 5 and 6). Each alternative is uniquely responsive to public comments identified during the scoping and comment periods on the draft EIS (DEIS). All action alternatives exclude proposed restoration and motorized travel management within traditional cultural properties (TCPs), which have special religious significance, structures, art, or objects that play an important role in the cultural history of a tribal group to preserve their integrity, as well as research natural areas (RNAs), classified wild river and wilderness areas. Alternative 6 is the agency-preferred alternative. Alternative 6 designates 47 miles of motorized trails, 24 miles of new ML 2 (mixed use) roads and 4 parking areas (along 17N49) as open for motorized use. In addition the following actions would occur on open roads for public safety and to reduce impacts to resources: Griffin Creek Bridge on 18N07 would be repaired, 107 miles of ML 2 roads would be stormproofed and 18 seasonal gates installed. Alternative 6 also restores drainage patterns and closes (gates or barricades) on 32 miles of ML 1 roads, 93 miles of UARs not designated and 53 miles of ML 1 and 2 roads identified for decommissioning. The final NFTS of roads and motorized trails would be maintained as per the Six Rivers Road Maintenance Project, authorized in January 2016. The selection of Alternative 6 requires a project-specific forest plan amendment to change the Recreation Opportunity Spectrum (ROS) to allow the designation of UAR segments as motorized trails on the NFTS.

The FEIS and draft Record of Decision (ROD) are available on the Six Rivers National Forest (SRNF) website at *www.fs.usda.gov/project/?project=38813*. This proposed decision is subject to objection pursuant to 36 CFR 218, Subparts A and B. Objections will only be accepted from those who submitted project-specific written comments during scoping or another designated comment period. Issues raised in objections must be based on previously submitted comments unless based on new information arising after the designated comment period(s). Objections must be submitted within 45 days following the publication of this legal notice in the Eureka Times-Standard. The date of this legal notice is the exclusive means for calculating the time to file an objection. Those wishing to object should not rely upon dates or timeframes provided by any other source. It is the objector's responsibility to ensure evidence of timely receipt (36 CFR 218.9). Objections must be submitted to the reviewing officer, via mail to: Randy Moore, Regional Forester, USDA Forest Service, Attn: Smith River National Recreation Area Restoration and Motorized Travel Management Final Environmental Impact Statement, 1323 Club Drive, Vallejo, CA; via FAX to (707) 562-9229; or hand-delivered during business hours (M-F; 8am to 4pm). Electronic objections, in common formats (.doc, .pdf, .rtf, .txt), may be submitted to: *objections-pacificsouthwest-regional-office@fs.fed.us* with the subject: *Smith River National Recreation Area Restoration and Motorized Travel Management Final Environmental Impact Statement*. Objections must include (36 CFR 218.8(d)): 1) name, address and telephone; 2) signature or other verification of authorship; 3) identify a single lead objector when applicable; 4) project name, responsible official name and title, and name of affected national forest(s) and/or ranger district(s); 5) reasons for, and suggested remedies to resolve, your objections; and, 6) description of the connection between your objections and your prior comments. Incorporate documents by reference only as provided for per 36 CFR 218.8(b).

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Summary

The Smith River National Recreation Area (Smith River NRA) of the Six Rivers National Forest (SRNF or forest) proposes to designate 47 miles of motorized trails, 24 miles of new ML 2 (mixed use) roads and 4 parking areas (along 17N49) as open for motorized use. In addition the following actions would occur on open roads for public safety and to reduce impacts to resources: Griffin Creek Bridge on 18N07 would be repaired, 107 miles of ML 2 roads would be stormproofed and 18 seasonal gates installed. Alternative 6 also restores drainage patterns and closes (gates or barricades) on 32 miles of ML 1 roads, 93 miles of UARs not designated and 53 miles of ML 1 and 2 roads identified for decommissioning. The final NFTS of roads and motorized trails would be maintained as per the *Road Maintenance Categorical Exclusion* (CE). This proposal is referred to as Alternative 6, the Preferred Alternative. The selection of Alternative 6 requires a project-specific forest plan amendment to change the Recreation Opportunity Spectrum (ROS) to allow for the designation of UAR segments as motorized trails on the NFTS.

The area affected by the proposal includes Smith River NRA, which makes up most of the Gasquet Ranger District (district), but excludes lands within congressionally designated wilderness areas. The project excludes UARs and NFTS roads and motorized trails that occur within traditional cultural properties (TCPs). This project has dual purposes: one is to involve the public in considering limited changes to the NFTS, consistent with Subpart B of the 2005 Travel Management Rule (final travel management rule; 36 CFR 212); and the other, to reduce risks to resources by implementing recommendations from the travel analysis process per Subpart A.

The result of this travel management planning effort would be an updated revised Motor Vehicle Use Map (MVUM) for the Smith River NRA. The MVUM identifies the NFTS roads and motorized trails open for public use, by vehicle type and season of use, where applicable, in accordance with 36 CFR 212 Subpart B. Only those actions that address the purpose and need for action within the decision discretion of the Responsible Official are being considered.

Significant Issues

Table 1-1 describes the significant issues identified through external scoping and further used to inform the development of the action alternatives.

Table 1-1. List of significant issues.

Issue Topic	Cause and Effect
1. Access and Recreation Opportunity	Concerns were raised that the Proposed Action may not provide adequate access to dispersed recreation sites; the proposed closing of NFTS roads and trails, and not designating or keeping more NFTS roads and trails may reduce motorized recreation opportunity, increase user conflict, and decrease motorized access to the forest; and closing roads and trails may reduce access to historic mining sites accessible by motorized vehicles. Alternatives 4 and 6 were created to address this issue.
2. Inventoried Roadless Areas (IRAs)	Concerns were raised that the proposed designation of motorized trails may affect the IRA characteristics of these areas including opportunities for solitude, undisturbed landscapes and primitive, non-motorized recreation. Opportunities for solitude and primitive non-motorized experiences are negatively impacted by the noise and disturbance of vehicles. Motorized trails may change the character of these otherwise undisturbed landscapes. Alternative 5 were developed to address this issue.

Issue Topic	Cause and Effect
3. Resource Impacts	Many commenters expressed concerns about impacts to a variety of natural resources including water quality, wildlife, and soils for example. In particular, impacts to botanical resources (threatened and endangered, and sensitive species) may result from allowing motorized use and/or ineffective mitigation on routes proposed for designation. Impacts to botanical resources may result from the introduction and spread of noxious weeds due to motorized use. Port-Orford-cedar (POC) may be threatened by the potential introduction and spread of POC root disease, caused by the spread of the non-native pathogen *Phytophthora lateralis*, due to allowing motorized use and ineffective mitigations on routes. Alternative 5 and 6 were developed to address this issue.
4. Traditional Cultural Properties (TCPs)	Many commenters expressed concerns that changes to the NFTS within TCPs may impact sacred sites and cultural values of regional tribes. In response to this issue, the geographic scope of the project was modified to exclude UARs and NFTS roads and motorized trails within TCPs in order to protect sacred sites and cultural values related to those areas. The modified project scope applies to all project action alternatives. The Proposed Action was eliminated from detailed study as it exceeds the modified geographic scope. Alternatives 3 (eliminated in the FEIS), 4, 5 and 6 were developed to address this issue.

Alternatives Considered in Detail

This final environmental impact statement (FEIS) discloses the effects of four alternatives—the no action and three action alternatives—that meet the purpose and need, and respond to the significant issues. The Proposed Action (Alternative 2) as described in the Notice of Intent published in the *Federal Register* on April 20, 2012, and the modified Proposed Action (Alternative 3) were eliminated from detailed study.

Minor changes to Alternatives 4 to 6 from the DEIS were made in response to public comments linked to user conflicts and new information. The four alternatives considered in detail for this analysis are listed in Table 1-2. Complete details of the alternatives are found in Chapter 2 of this document.

Table 1-2. List of alternatives considered in detail.

Alternative	Description
Alternative 1: No Action Alternative	Alternative 1 provides a baseline for comparing the other alternatives. This alternative maintains the status quo. Under this alternative, current management plans continue to guide management of the project area. No changes are made to the current NFTS. The agency takes no affirmative action on any UARs. • No changes would occur to existing NFTS o 0 miles of motorized trails o 0 miles of new ML 2 (mixed use) o 0 parking areas along 17N49 o Griffin Creek Bridge on 18N07 would remain structurally unsound o 0 miles of NFTS roads would be stormproofed o 0 seasonal gates installed o 0 miles of ML 1 roads with drainage patterns restored and gated o 0 miles of ML 1 and 2 roads decommissioned and barricaded o 0 miles of UARs with drainage patterns restored and barricaded o 0 year round gates installed • Maintenance would occur on existing roads and motorized trails.

Alternative	Description
Alternative 4	Alternative 4 responds to issues concerning impacts on motorized recreation. This alternative was developed to provide increased opportunities for motorized recreation. Specifically, this alternative designates more motorized trails and ML 2 roads to address motorized recreation opportunity; designates more motorized trails; maintains more ML 2 roads; and designates parking along 17N49. Alternative 4: • Opened to motorized use – with safety and resource mitigations o 66.3 miles of motorized trails o 38.6 miles of new ML 2 (mixed use) o 5 parking areas along 17N49 o Griffin Creek Bridge on 18N07 would be repaired o 111.7 miles of NFTS roads would be stormproofed o 17 seasonal gates installed • Closed to motorized use o 20.5 miles of ML 1 roads with drainage patterns restored and gated o 53.6 miles of ML 1 and 2 roads decommissioned and barricaded o 71.2 miles of UARs with drainage patterns restored and barricaded o 5 year round gates installed • 6 acres of land with change in Recreation Opportunity Spectrum • Maintain NFTS roads and motorized trails
Alternative 5	Alternative 5 responds to issues concerning impacts to forest resources and IRAs. This alternative was developed to reduce the miles of roads and motorized trails open for motorized travel with specific attention given to protecting non-motorized recreation opportunities in IRAs, increasing the level of protection for POC and botanical resources. Specifically, this alternative does not designate motorized trails in IRAs; reduces motorized access to stands of POC; reduces motorized access to areas with endangered and sensitive botanical species; barricades all UARs not proposed for designation on the NFTS; stormproofs NFTS roads and a motorized trail; and restores drainage patterns on short UARs. Alternative 5: • Opened to motorized use – with safety and resource mitigations o 7.4 miles of motorized trails o 21.7 miles of new ML 2 (mixed use) o 4 parking areas along 17N49 o Griffin Creek Bridge on 18N07 would be repaired o 58.6 miles of NFTS roads would be stormproofed o 4 seasonal gates installed • Closed to motorized use o 61.1 miles of ML 1 roads with drainage patterns restored and gated o 110 miles of ML 1 and 2 roads decommissioned and barricaded o 133 miles of UARs with drainage patterns restored and barricaded o 4 year round gates installed • 6 acres of land with change in Recreation Opportunity Spectrum • Maintain NFTS roads and motorized trails

Alternative	Description

Alternative 6: Agency-Preferred Alternative	Alternative 6 makes limited changes to address key issues identified through public scoping and comments related to restoration of drainage patterns; barricades inventoried UARs not designated on the NFTS; and designates parking and allows for mixed-use along Forest Roads 17N49 and 17N07.
	Alternative 6:
	• Opened to motorized use – with safety and resource mitigations
	  o 47 miles of motorized trails
	  o 24 miles of new ML 2 (mixed use)
	  o 4 parking areas along 17N49
	  o Griffin Creek Bridge on 18N07 would be repaired
	  o 107 miles of NFTS roads would be stormproofed
	  o 18 seasonal gates installed.
	• Closed to motorized use
	  o 32 miles of ML 1 roads with drainage patterns restored and gated
	  o 53 miles of ML 1 and 2 roads decommissioned and barricaded
	  o 93 miles of UARs with drainage patterns restored and barricaded
	  o 4 year-round gates installed.
	• Change in Recreation Opportunity Spectrum on 6 acres of land.
	• Maintains NFTS roads and motorized trails.

Summary of Environmental Consequences

Table 1-3 summarizes the environmental consequences by providing an average ranking of each alternative by resource area. Detailed information may be found in Chapter 3.

Table 1-3. Summary of effects and ranking of alternatives by resource.

Resource Area	Rankings of Alternatives, averaged across indicators[1]			
	Alt 1	Alt 4	Alt 5	Alt 6
Aquatic Biota	1	2	4	3
Botanical Resources	2	2	4	3
Cultural Resources	2.5	2.5	4	4
Fire & Fuels	4	3	1	2
Geology	1	1	4	3
Inventoried Roadless Areas	1.6	2.4	3.5	2.9
Noxious Weeds	3	2	4	3
Port-Orford-cedar	1	2.5	2.5	4
Recreation Resources	2	4	1	3
Soil Resource	1	2	3	4
Transportation Facilities	2.5	1	4	2.5
Visual Resources	1	2	4	3
Water Resources	1	2	4	3
Wildlife	1	2	4	3

[1] A score of 5 indicates the alternative has the least impact for the specified resource; a score of 1 indicates the alternative is the most impact for specified resource. See Chapter 3 for more details.

Chapter 1. Purpose and Need and Proposed Action

Document Structure

The US Forest Service (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 result from the no action alternative and action alternatives considered in detail. The document is organized into four chapters:

- **Chapter 1. Purpose and Need for Action:** This chapter briefly describes the proposal, the need for that action. It also details how the Forest Service informed the public of the proposal and action alternatives and how the public responded.
- **Chapter 2. The Alternatives, including the Proposed Action:** This chapter provides a detailed description of the alternatives that were developed in response to comments raised by the public during scoping. The end of the chapter includes a summary table comparing the alternatives with respect to their environmental impacts.
- **Chapter 3. Affected Environment and Environmental Consequences:** This chapter describes the affected environment and environmental effects of the alternatives.
- **Chapter 4. Consultation and Coordination:** This chapter provides a list of preparers and agencies consulted during the development of the EIS.
- **Appendices:** The appendices provide more detailed information to support the analyses presented in the EIS.
- **Index:** The index provides page numbers by document topic.

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

Changes between Draft & Final Environmental Impact Statements

Following distribution of the *Smith River National Recreation Area Restoration and Motorized Travel Management DEIS*, minor grammatical changes, formatting and spelling corrections, along with additions and modifications to the FEIS were made to respond to public comment, improve document accuracy and clarity, and update the analysis in response to changed circumstances and changes in the existing condition. These changes are identified below and organized by FEIS chapter and section where relevant.

Summary

The description of alternatives was updated to reflect changes in the total miles and actions identified in Chapter 2 and Appendix A.

Chapter 1

Background. Discussions of recreation values, the NVUM, and key watersheds were added.

Changes between Draft and Final Environmental Impact Statements. This section was added to disclose grammatical and technical errors, and additional information incorporated in the FEIS, in response to changed conditions and/or public comment.

Scope of the Project. A limited number of ML 3 roads were considered for downgrading to ML 2, in response to a change in existing conditions identified through coordination with Del Norte County. This change in the project scope provides for more motorized recreation opportunities by allowing mixed-use on forest roads directly connected to county roads that allow for mixed-use. Downgrading particular ML 3 roads, identified by Del Norte County through the county coordination process, was considered when the road surface type, use levels and road geometry were compatible with this type of use.

Purpose and Need. More clearly defined as to what the purpose is and what the needs are. An introductory paragraph is added.

Proposed Action. Description of how the Proposed Action was carried forward into Alternative 6, the Preferred Alternative, was added.

Comment on the DEIS. This section was added, which describes how the comment period was noticed, the length of the comment period, and who and how many individuals and organizations provided comment on the DEIS.

Background

This travel management proposal is just one of many in the SRNF's continuing effort to manage the transportation system to meet current and future administrative and public needs. According to the National Visitor Use Monitoring (NVUM) survey conducted on the forest (USDA 2008), out of the 224,000 recreational visitors, approximately 55,776 visitors spent some time driving for pleasure and 4,256 used off-highway vehicles (OHVs) during their visit (including motorized trail activities). The NVUM data highlights the contribution of forest-based recreation in connecting the American people to their natural and cultural heritage, an important element of the Forest Service Recreation Strategy. Such connections are deemed critical to the cultivation of a conservation ethic and sense of resource stewardship among Americans.

The watersheds of Pacific Northwest national forests provide clean water for communities and support some of the remaining wild runs of salmon, steelhead, and cutthroat trout. The 1990 *Smith River National Recreation Area Act* established the Smith River NRA, various wild and scenic river segments within the Smith River NRA and restricted off-road vehicle use to designated roads and trails on the NFTS. This was in recognition that unmanaged OHV use could threaten scenic beauty, renowned anadromous fisheries, exceptional water quality, and abundant wildlife, and that a new statute would better manage legitimate OHV use considering the Smith River NRA's exceptional opportunities for a wide range of multiple uses.

In 1994, with the Forest Service and Bureau of Land Management (BLM) adoption of the Northwest Forest Plan (NWFP), a large network of key salmonid watersheds[2] received additional habitat protection and specific management direction to restore stream and riparian habitat at the watershed scale. It is recognized that management decisions related to travel management can affect aquatic species by influencing sedimentation to stream habitat from elevated road densities, particularly where compacted surfaces lie within or cross sensitive riparian and streamside areas. It is Forest Service policy to minimize damage to vegetation, avoid harassment to aquatic-dependent species and habitat, and avoid significant disruption and restore aquatic-dependent species and habitat when providing for motorized public use on NFS lands (FSM 2353.03(2)).

On August 11, 2003, the Forest Service's Pacific Southwest Region entered into a Memorandum of Intent (MOI) with the California Off-Highway Motor Vehicle Recreation Commission, and the Off-Highway Motor Vehicle Recreation Division of the California Department of Parks and Recreation, which set in motion a region-wide effort to "Inventory and Designate OHV roads, trails, and any specifically defined open areas for motor vehicles on maps of the 19 National Forests in California by 2007."

In 2004, then Forest Service Chief Dale Bosworth, named *unmanaged recreation*, including impacts from OHVs, as one of *four key threats facing the nation's forests and grasslands*. Unmanaged motorized use, particularly OHV use, has resulted in soil erosion, watershed and habitat degradation, spread of disease and impacts to cultural resource sites.

Final Travel Management Rule

The 2005 final travel management rule (36 CFR 212) provides direction for managing OHV use on NFS lands on a national scale, aimed at better addressing the inherent potential for increased conflicts between motorized and non-motorized users, risk to public safety, and resource effects from growing popularity and expanding OHV use through improved technologies. In light of national public interests and recognition that indirect revenues are important to local lifestyles and economic stability, the USDA decided that evaluating the use of roads, trails and areas on national forests are best made at the local level, with full involvement of federal, tribal, state, and local governments, motorized and non-motorized users, and other interested parties.

The final directives describe a travel analysis process used for two purposes (Subparts A and B):

[2] Key watershed: The Smith River is designated a *key watershed* to protect fisheries and other aquatic biota, water quality, and riparian vegetation under the *Six Rivers National Forest Land and Resource Management Plan* (Forest Plan). The Forest Plan provides standards and guidelines for managing roads and vehicle access to preserve water quality throughout a system of large refugia crucial to at-risk fish stocks (pp. IV-106 to IV-111).

- Identification of the minimum road system that incorporates a science-based roads analysis under 36 CFR 212.5(b), and
- Designation of roads, trails, and areas under 36 CFR 212.51.

The SRNF's Subpart A and B travel analysis process considered closing and decommissioning roads, conversion of UARs to motorized trails and the reclassification of NFTS road maintenance levels[3] as illustrated in Figure 1-1, to better manage motorized travel and restore environments, altered during their original construction many years ago. The maintenance-level classification correlates to how the agency administers the intended use—type of vehicle and season(s), closed or open for travel—and maintenance frequency and methods, based upon road design, surface conditions, intended vehicle speed, season and amount of motor-vehicle use.

Figure 1-1. Photos (clockwise from upper left): ML 3 road designed for highway-legal passenger cars; ML 2 road designed for high-clearance wheeled vehicles; UAR used as a motorized trail; and, ML 1 road in storage.

The combined travel analysis reports provide recommendations considered timing of use, all types of vehicles, and all maintenance-level road classifications. The combined travel analysis reports include the following documents:

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[3] Maintenance Level (ML): The Forest Service maintains NFS roads and NFS trails to meet user needs, protect natural resources and ensure public safety. There are five maintenance level classifications (FSH 7709.56), responsive to road or trail management objectives, design standards, quantity and types of traffic, and availability of funds. In 2015, the forest supervisor authorized *the Six Rivers Road Maintenance Project* to implement road maintenance across the forest (ML 1 to 5), confined to previously maintained surfaces, ditches, culverts and cut-and-fill slopes within the road prism, not intended to substantially improve conditions above those originally constructed (i.e. did not change maintenance levels).

- The *Smith River NRA Roads Analysis Process and Off-Highway Vehicle Strategy* (Smith River NRA RAP/OHV Strategy; USDA 2005) presents the analysis and management recommendations for UARs and Forest Service roads with maintenance level (ML) 1[4] and ML 2[5] on the NFTS.
- The *SRNF Roads Analysis Process* (RAP; USDA 2003) and *Smith River NRA Travel Analysis Process* (TAP; USDA 2005) present the analysis and management recommendations for MLs 3[6], 4, and 5 roads on the NFTS. The scope of my decision does not include consideration for mixed use on these maintenance levels.

The result of these two analysis was two categories for the project development. The first list identified existing roads that were at the proper maintenance level and that required no additional mitigation measures for public safety or resource concerns. These roads were not carried forward in this FEIS, as no decisions were necessary. As the project evolved, some of these roads ended up moving to the second list as part of the public scoping and collaborative efforts. The second list included all of the UARs, and existing ML 1 and ML 2 roads where management actions could occur that would meet the purpose and need, and existing ML 1 and 2 where the maintenance level would remain the same, however, management actions could occur to improve public safety and resource concerns. Appendix A has a complete list of the existing NFTS system roads, identifying which roads were carried forward into this FEIS, as well as a list of the UARs identified in the Smith River NRA RAP/OHV Strategy.

The NFTS is always changing depending on resource needs, and public and management concerns. Implementation of this current project is one-step in the overall management of motor-vehicle travel on the SRNF. Other ongoing efforts include: 1) temporary forest orders (e.g., fire restrictions, ceremonial closures); 2) Emergency Relief for Federally Owned Roads (ERFO) program; 3) administration of the recreation program; 4) administration of the vegetation management program; and 5) addressing impacts associated with the current NFTS through the forest's road operation and maintenance program. Together, these efforts contribute to sustainable management of the forest's NFTS.

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[4] ML 1 road: Defined in FSH 7709.58, 10, 12.3 as intermittent service roads during the time they are closed to vehicular traffic and placed in *storage*. The closure period must exceed 1 year. No maintenance other condition surveys may be required, so as long as no potential exists for resource damage. If surveys indicate there is resource damage occurring, generally activities are rectifying damage of legacy drainage structures to restore natural storm-runoff patterns. These roads are maintained in a hydrologically maintenance free, storage conditions that involves removing culverts and implementing road drainage improvements (similar to *stormproofing* treatments). Maintenance Level 1 roads may be of any type, class, or construction standard, and may be managed at any other maintenance level during the time they are open for traffic.

[5] ML 2 road: Defined in FSH 7709.58, 10, 12.3 as roads open for use by high-clearance vehicles. Passenger car traffic is not a consideration. Traffic is normally minor, usually consisting of administrative, permitted, dispersed recreation, or other specialized uses. These roads are designed for low traffic volume and low speed and typically connect collectors and other local roads.

[6] ML 3 road: Defined in FSH 7709.58, 10, 12.3 as roads open and maintained for travel by prudent drivers in a standard passenger car. User comfort and convenience are low priorities. Roads in this maintenance level are typically low speed, single lane with turnouts, and spot surfacing. Some roads may be fully surfaced with either native or processed material. Maintenance level 3, 4 and 5 roads are subject to the requirements of the Highway Safety Act and Manual of Uniform Traffic Control Devices (MUTCD).

Scope of the Project

This proposal is narrowly focused on limited changes to the designation of roads and motorized trails for motor vehicle use on the NFTS, in accordance with 36 CFR Part 212, A and Subpart B. Consistent with Forest Service policy for travel analysis, the SRNF considered public and administrative needs, identified issues, assessed benefits and risks; and, through the alternatives analyzed in this EIS, opportunities to respond to public interests, improve infrastructure and proactively rectify and restore natural resources. For travel management, the federal action requiring NEPA analysis and decision is any change to the current NFTS (e.g., adding or removing facilities, changing season of use).

The following list summarizes the key elements considered by the Forest Service as the framework for the scope of the action in continuing to move the travel management process forward. The SRNF focused the environmental analysis on the changes from the current situation and did not aim to solve all travel management issues at once. During the planning process, transportation atlas and landownership database errors were corrected. A tightly focused collaborative process was developed; informed by site-specific road and motorized trail surveys, travel analyses and reporting completed by the SRNF as of 2003. For example, the scope of the proposal *does not consider*:

- Designating areas or dispersed sites on the NFTS. The 1990 NRA Act limits motorized travel to designated routes (motorized trails and roads); therefore management of play areas for mudding, rock crawling, or hill climbing and areas used as dispersed day and overnight campsites is outside the scope of the project.
- Parking beyond one vehicle length, or greater than 30 feet from the edge of the road surface.
- Designating motorized trails or OHV mixed use recreational riding opportunities on UARS or ML 1 roads on the NFTS that access legacy mine sites and ML 3 to 5 roads. These transportation networks require a high degree of analysis when considering mixed use due to elevated risks to public safety associated with higher speeds and limitations of OHV technology.
- Already authorized restricted timing of OHV use (seasonal road closures) for resource protection on roads and motorized trails not being considered under any action alternative. For example, FS Road 18N07 and associated spur roads, and FS Road 18N16 will continue to be closed to vehicle access to prevent the introduction of the Port-Orford-cedar root disease into uninfested areas of the North Fork Smith River Botanical Area.
- Any activity associated with contract, permit, lease or other written authorization that is exempt from designation under the Travel Management Rule (36 CFR 212.51 (a) (8)) and is not part of the proposal (e.g., fuelwood permits, mining activity, etc.). Such actions are subject to separate project-level NEPA analysis.
- Changes to the NFTS within Research Natural Areas, classified Wild River corridors, Wilderness designations and TCPs.
- Whether motorized use and maintenance is permissible in inventoried roadless areas (IRAs) (36 CFR 294 Subpart B). The overarching decisions on the allowance of motorized uses within IRAs

or revision (subject to the provisions of the Roadless Rule and 36 CFR 294.11), are not being revisited herein. Motorized uses have been ongoing since before the LRMP was signed. The proposal seeks to accommodate existing uses, while minimizing undesirable resource effects by managing OHV use.

- New road or motorized trail construction or reconstruction.
- Emergency response efforts, in response to threats to health and safety, are not subject to travel prohibitions (36 CFR 212 Subpart B, 212.51 a (5)).
- Use of wheelchairs and mobility devices by a mobility-impaired person, which are allowed on all NFS lands that are open to foot travel (Americans with Disabilities Act 504, FSM 2353.05, and Title V, §507(c)).

The proposal *does reconsider*:

- Select road maintenance level reclassifications pertaining to ML 1 and ML 2s, and select ML3 segments. Specifically, segments of Forest Roads 17N49 and 17N07 (classified as ML 3) are proposed for being downgraded to ML 2 to allow for mixed-use motorized travel.
- Proposals to designate low and moderate risk-rated UARs (refer to Smith River RAP/OHV Strategy) as motorized trails to the NFTS.
- The Forest Service is currently managing seasonal road closures that vary from year to year based on the onset of wet weather per Subpart B (36 CFR 212.56) of the final travel management rule. Allowable seasonal motorized travel on select roads as displayed on the 2009 MVUM are being reconsidered for a higher level of resource protection. This proposal considers prohibiting use altogether through permanent closures (barricading and decommissioning), or placement of new gates with year round travel closures.

One result of the travel management planning effort will be the publication of an updated MVUM for the district, which may be reviewed annually to determine the need for updates. The MVUM identifies NFTS roads and motorized trails open for public use, by vehicle type and season of use, and where applicable, in accordance with 36 CFR 212 Subpart B. Only those actions that address the purpose and need for action within the decision discretion of the Responsible Official are being reconsidered.

Project Area

The Project Area (see Figure 1-2) encompasses a portion of the Smith River NRA, exclusive of lands within congressionally designated wilderness areas, classified wild river, research natural areas (RNAs) and TCPs (Figure 1 -2). The legal description is T18N, R1E - R5E; T17N, R1E - R5E; T16N, R1E- R4E; T15N R20E; T15N, R3E - R4E; T14N, R2E - R3E; T13N, R2E - R3E, in Del Norte County, California.

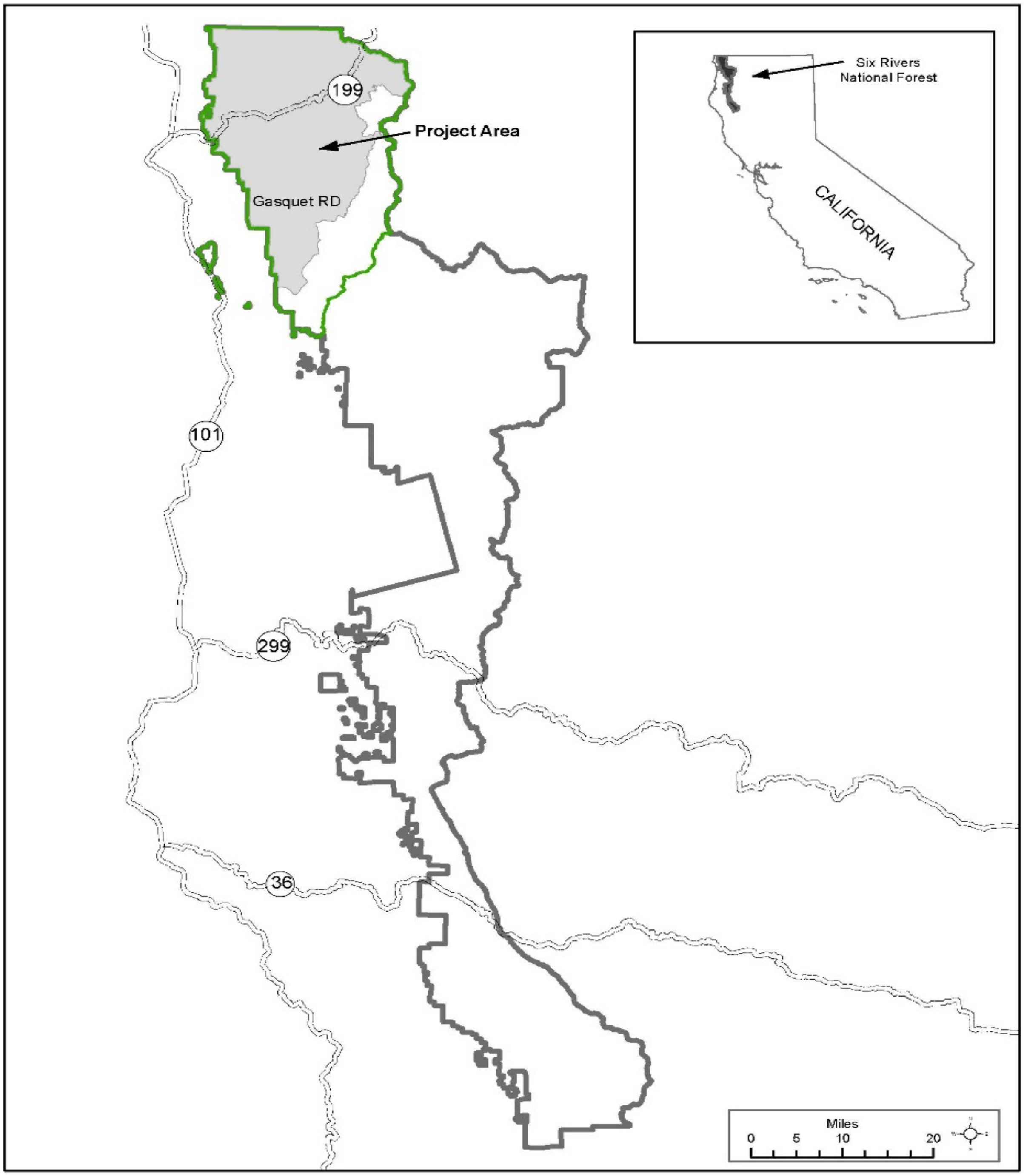

Figure 1-2. Project area map.

Purpose and Need for Action

The purpose of the *Smith River National Recreation Area Restoration and Motorized Travel Management Project* is to preserve and restore the Smith River NRA's outstanding natural resources for many years to come, while improving the NFTS to promote safe and efficient motorized travel for administration, utilization, protection of NFS lands, and best serve communities.

The underlying need for making limited changes to the NFTS within the Smith River NRA is to minimize conflicts between motorized and non-motorized recreational experiences, improve public safety, and rectify and restore environments damaged by unmanaged motorized travel (36 CFR 212.54; Subpart A and 36 CFR 261.13; Subpart B).

Motorized Recreation

> *There is a need for providing adequate public access, including vehicular roads and motorized trails to serve recreational activities such as camping, hunting, fishing hiking, exploration and riding experiences in a variety of environments and modes of travel, consistent with the Forest Service's recreation role and land capability (FSM 2353.03(2)).*

Unlike most national forests, where the outcome of prolonged, repeated OHV travel are spider webs of motorized trails (generally less than 50 inches wide), many of the UARs within the Smith River NRA used by OHV users today are along legacy roads (greater than 50 inches wide), as illustrated in Figure 1-3. The majority of these roads accommodated commercial logging, as well as mining operations and equipment to transport gold, first discovered in Del Norte County in 1851 (Keter 1995:2), and not long after, copper, chromite, platinum, silver, cinnabar and other mineral resources being mined extensively throughout the Smith River basin.

Figure 1-3. Howland Hills Road used to haul logs out of what is now the Smith River NRA.

The designation of much of the Smith River basin in 1907 as Forest Reserve lands marked the beginning of a significant change in the intensity of human land-use activities. Although some activities such as mining continued, a more intensive development of the interior of Del Norte County began to take place—including construction of trails, roads, guard stations, fire lookouts, telephone lines, and for the first time, recreational facilities. For this reason, most of the UARs used by the public today within the Smith River NRA are generally well suited for accessing the outdoors by motorized and non-motorized users alike all year.

Some UARs connect segments of roads open to the public establishing loop networks that can safely accommodate both highway-legal and non-highway legal, high-clearance wheeled vehicles and low-clearance passenger cars, referred to as *mixed use*, as depicted in Figure 1-4. Since UARs do not have the same status as NFS roads and trails in the NFTS atlas, without authorizing select UARs and revising the 2009 MVUM, travel would continue to be restricted to non-motorized means only, and access to long-established dispersed sites and other recreational motorized riding opportunities could not be authorized.

Although these UARs are not included on the 2009 MVUM as open for public use, the final travel management rule does not deter reconsidering designations as long as NEPA requirements and local public comments are considered when making any decisions, including altering the timing of use.

Administrative Access

There is a need for a well-designed, minimum NFTS that is safe and efficient for administrative motorized-vehicle travel and access for multiple-use management.

Figure 1-4. Unauthorized route considered safe for low- and high-clearance vehicles.

The Forest Service supports cooperative road development, including construction, maintenance, and reciprocal rights-of-way, where public and private lands are intermingled, as depicted on the 2009 MVUM. The NFTS not only provides opportunities for scenic travel and access to developed and dispersed campsites, it is also critical in facilitating authorized special uses, commercial activities and forest-management practices. Some segments establish connections to other transportation systems, such as those that provide access to private inholdings and those under jurisdiction of Del Norte County.

Within the Smith River NRA, administrative access is critical to executing fire suppression to protect the Smith River NRA's outstanding natural resources. The NFTS serves as the means to efficiently and safely transport firefighters, materials and equipment. In the event a wildfire threatens human life, the Community Wildfire Protection Plan (CWPP) identified some NFTS roads as evacuation routes.

The NFTS is also vital to implementing fuels reduction, vegetation management, watershed restoration, monitoring, and research, to name a few. The Smith River NRA RAP/OHV Strategy provides recommendations for administrative needs, developed in coordination with affected landowners, Del Norte County, state and other adjacent federal agencies. It also identifies road-specific recommendations to improve NFTS infrastructure drainage and surfacing (referred to as *stormproofing*[7]) to enhance safety and efficiency.

Forest roads occasionally bridge water crossings. Routine bridge inspection in 2015 identified the need to repair Griffin Creek Bridge located on Forest Road 18N07, as it is primary access for fire suppression, administration, and multiple-uses.

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[7] *Stormproofing*: Agency term referring to relatively low-cost treatments on NFTS roads and trails primarily open to the public, including activities such as replacing undersized culverts and cross drains, constructing diversion dips at road-stream crossings, water bars, out-sloping and broad-based drain dips depending on site-specific conditions. The objectives are to reduce the chronic effects of roads (e.g., fine sediment delivery) and reduce the likelihood and consequences of catastrophic failures (e.g., diversion onto roads), typically associated with large storm events. These long-standing agency practices are applicable across extensive portions of the NFTS network aimed at protecting aquatic resources and infrastructure. They are designed to complement the higher-cost treatments (e.g., putting level 1 roads into road storage, decommissioning, road realignments, redesigning of culverts for fish passage), typically implemented on relatively small segments of the network that pose a high or moderate risk to water quality and fisheries.

Restoration of Drainage Patterns

There is a need for restoring natural drainage conditions and reduce sedimentation from UARs and unneeded NFTS roads that are currently affecting riparian and streamside areas.

The long-lasting environmental effects of unmanaged roads and associated OHV use have been studied and documented over the past several decades. In 2004, Forest Service Chief Dale Bosworth identified unmanaged motorized recreation as one of the top four threats to national forest resources. When Congressman Bosco introduced the Smith River NRA legislation in 1990, he referred to the Smith River as the crown jewel of California's wild and scenic rivers. The Tolowa Indians also recognized the river's jewel-like qualities, naming it *Hiouchi* (O-Yu-cIT), which means *important* or *beautiful water*.

Figure 1-5. Coastal cutthroat trout in the North Fork Smith River.

Today, the Smith is one of the few river basins in California that remains undammed. Designated as a key watershed in the SRNF Land and Resource Management Plan (Forest Plan), the Smith River preserves water quality throughout a system of large refugia crucial to at-risk fish stocks, as seen in Figure 1-5 at right. The analysis conducted for the *Smith River NRA RAP/OHV Strategy* indicates the physical compacted footprint of select UARs is acting to redirect and channel storm-event precipitation and accelerate sedimentation into nearby streams, degrading water quality and habitats of some of the last remaining wild runs of salmon, steelhead, and cutthroat trout in California.

Riparian plant communities, dependent on wet soils, play a vital role in providing shade to maintain low water temperatures, filter deposits and pollutants, and stabilize streambanks and in- and near-stream woody debris that support habitats and proper hydrological function (amount, timing, storage and release of groundwater). Forest Service inventories conducted to inform the *Smith River NRA RAP/OHV Strategy* indicate that roads constructed with earthen-fill crossings through stream channels present the highest potential for increased sedimentation, and in several cases, are realigning stream channels. Nearly 50 percent of user-preferred UARs in proximity to stream and unstable slumps are in need of drainage upgrades and restoration of road-related gullies, rills, and road prism and bank failures. Gibbons and Salo (1973 op. cit.; Furniss 1991) found that sediment contributions per unit area from roads is much greater than from all other land management activities combined, including log skidding and yarding. In general, roads have been a primary source of sediment impacts in developed watersheds (Everett et al. 1994; Rhodes et al. 1994; Wissmar et al. 1994).

The agency identified the need for reducing sediment delivery to streams along specific roads segments and UARs, particularly where poorly designed trails are causing unacceptable environmental impacts to riparian and other sensitive resources. The agency recommendations from the *Smith River NRA RAP/OHV Strategy* include improving the NFTS infrastructure and restoring natural drainage patterns on select UARs, downgrading MLs, eliminating select roads on the NFTS to all vehicle traffic and limiting the season of use.

Affordability

There is a need for improving cost efficiencies associated with maintenance of the NFTS.

Since Congress authorizes Forest Service appropriations, funding for maintaining roads and motorized trails are beyond the scope of the final travel management rule. The Forest Service is committed to using whatever funds are available to follow the final travel management rule in a targeted, efficient manner. The agency makes appropriate use of all sources of available funding and has many successful cooperative relationships. Volunteer agreements with user groups and others have proven successful in extending agency resources for trail construction, maintenance, monitoring and mitigation.

The agency recommendations took into account affordability by eliminating unneeded roads, reducing maintenance levels where appropriate and, in some cases, road redesign to reduce maintenance requirements (such as out sloping segments). Specifically, the agency considered costs unique to each maintenance level classification, amount of public use and safety (Forest Service Manual (FSM) 2350 and 7700), and compliance with trail and road management objectives (TMOs; RMOs), operational maintenance levels (OMLs)[8] and State traffic regulations (California Vehicle Code (CVC); 36 CFR 212.5a).[9]

Forest Considerations

The responsible official shall consider the following when designating roads, trails, and areas on the provision of opportunities, access needs, and user conflicts among uses of NFS lands (36 CFR 212.55(a)):

Del Norte County: Lifestyles, attitudes, beliefs and values.

Environmental justice speaks to concerns that costs of federal decisions could fall disproportionately on people of a particular ethnic or cultural heritage group, or on people with low incomes. A well-designed and maintained NFTS is fundamental to sustaining cultural integrity and local revenues.

Del Norte County's population represents diverse cultures, lifestyles and travel-management interests. During road and travel analysis, parties with a stake in travel management expressed a variety of interests—many conflicting. Just as attitudes, beliefs, and values differ among stakeholders, so do their uses of the forest and their desired direction for travel management. A common belief by those who favor motorized recreation is that Proposed Action greatly reduces motorized access. In contrast, those who value quiet recreation and reference landscapes, it is a common belief that the Proposed Action greatly increases opportunities for motorized access.

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[8] Objective and Operational Maintenance Levels (OMLs): Roads may be currently maintained at one level and planned to be maintained at a different level at some future date. The operational maintenance level is the maintenance level currently assigned to a road considering today's needs, road condition, budget constraints, and environmental concerns; in other words, it defines the level the road is currently maintained. The objective maintenance level is the maintenance level assigned at a future date, considering road management objectives, traffic needs, budget constraints, and environmental concerns.

[9] California Vehicle Code (CVC): The CVC regulates the use of motor vehicles in California, including motor vehicles used on the national forests. The CVC sets safety standards for motor vehicles and vehicle operators. It defines the safety equipment needed for highway legal and non-highway legal vehicles. It also defines the roads and motorized trails where non-highway legal motor vehicles maybe operated.

Economic activities occurring in Del Norte County, and supported by outdoor enthusiasts and travelers, include fishing, hunting, hiking, rafting, and wildlife viewing. The SRNF contributes to the county's economic stability in two primary ways: 1) through the generation of income and employment opportunities for residents in the immediate area, and 2) through direct and indirect contributions to local county revenues, some from tourism dependent on national forest natural resources. The Forest Service also contributes in secondary ways, such as through production of goods and services in local and regional markets.

Collaboration indicates there is consensus locally that motorized travel and the basis for making limited changes to recreational access networks should consider level of use and serve public and Del Norte County diverse livelihoods and human wellbeing (e.g., cultural subsistence gathering and hunting, lifestyles, traditional customs, tourism, clean water, biodiversity, scenic landscapes and wildlife habitats). With an estimated 65 percent of Del Norte County's under the administration of the Forest Service, the need to be responsive becomes vital.

Local Native American cultural values and contemporary uses.

Native Americans have inhabited the Smith River watershed for thousands of years as skillful stewards of the land, with many accounts of their long history of sustainable gathering practices for subsistence, ceremonial, and cultural uses. Today, Native Americans from a number of tribes, including the Yurok Tribe, Elk Valley Rancheria and Smith River Rancheria (now the Tolowa Dee-Ni′ Nation) since 2005, continue to use the NFTS to access the Smith River NRA to perform ceremonies and vision quests, for gathering traditional food and medicinal plants, and basket-weaving materials, as well as for hunting and collecting firewood. There are seasonal villages or temporary camps along river corridors, and sensitive religious and cultural locations, including areas used for the collection of traditional botanical materials. Many Native Americans prefer motorized modes of travel, particularly the elderly and those unable to travel by foot or horseback.

Some recreational activities take place in the same locations that have been in use for countless generations, placing some cultural resources and values at-risk from unmanaged motorized travel. In 1966, Congress declared that the federal government "administer federally owned, administered, or controlled prehistoric and historic resources in a spirit of stewardship for the inspiration and benefit of present and future generations" (National Historic Preservation Act (NHPA, 16 USC 470-1(3))). This need was made more explicit when the NHPA was amended in 1980 and §110 was added to expand and underscore federal agency responsibility for identifying and protecting historic properties and avoiding unnecessary damage to them. The agency's recommendations informed by the travel analysis are to provide access for ceremonial customs and lifestyles, while strategically avoiding motorized use near artifacts and scared sites and areas to avert looting and vandalism.

Public safety.

There is a need for providing safe motorized travel by educating motorized users of hazards, particularly where roads and trails are in contact with naturally occurring asbestos in the soil. The placement of informational and speed limit signs are necessary to inform users of health risks linked to breathing asbestos, and to encourage drivers to slow down to keep dust levels low to lessen the potential for inhaling contaminated air.

There is a need for repairing Griffin Creek Bridge located on Forest Road 18N07 (Knopki Creek Road). The bridge has a major crack in one of its three main girder laminate beams, and in its current condition does not support the load-bearing requirements necessary to allow trucks with horse-trailers, fire engines, or water tenders to cross. Forest Road 18N07, which begins at US Highway 199, is the main access to the upper Knopki Creek watershed, where popular dispersed recreation opportunities exist, such as Sanger Lake, Sanger Meadows, and access to Young's Valley Trailhead, a popular trail into the Siskiyou Wilderness. The road also provides critical motorized access for fire suppression, and administration. Other partners, such as the California Department of Transportation (CalTrans), also use Forest Road 18N07 for US highway construction projects waste staging and disposal.

Access to public and private lands.

The federal government, unlike state and county governments, does not have the authority to pursue adjudication of prescriptive rights over routes with historic use. The Forest Service may only acquire rights-of-way through purchase, exchange, donation, or eminent domain (condemnation), in accordance with the Federal Land Policy and Management Act (FLPMA, PL 94-579, §205(a)). Without right-of-way acquisition by one of those means, the Forest Service has no right-of-way for either administrative or public access.

In making designations for motor vehicle use, the responsible official must recognize valid existing rights (36 CFR 212.55(d)). FSM 7703.3 provides an administrative framework for meeting this requirement by providing guidance on documenting jurisdiction, transferring jurisdiction, and exercising jurisdiction over forest roads, based on factors such as the right of individuals and local public road authorities to own, operate, maintain, and use these roads. The Forest Service reviewed property rights, easement records, and jurisdiction of routes identifying needs for roads transecting private lands to improve the NFTS, while restricting public access to private land inholding parcels by placing gates or other barriers to prevent trespassing and looting.

Availability of financial resources for maintenance and administration of roads, trails, and areas that would arise if the uses under consideration were designated.

The *Six Rivers Road Maintenance* project, authorized in January 2016, applies to all NFTS maintenance levels (ML 1 through 5) managed by the SRNF, including the Smith River NRA, and the Ukonom District of the Klamath National Forest. The *Six Rivers Road Maintenance* project complements the *Smith River National Recreation Area Restoration and Motorized Travel Management* project, by preserving investments in NFTS infrastructure to mandated design standards that sustain safe public and administrative access to NFS lands (Highway Safety Act), while preventing resource damage (Forest Plan, p. IV-49; Clean Water Act; and Endangered Species Act).

Specifically, the *Six Rivers Road Maintenance* project design criteria, mitigation measures and annual operating allowance thresholds are applicable to road designations included in the *Smith River National Recreation Area Restoration and Motorized Travel Management* project including:

- Smoothing road surfaces, repairing road signs, removing hazards and vegetation blocking driver visibility to maintain drivable road conditions that promote safe passage on all roads open for the public to drive (ML 2-5).
- Maintaining road stream crossings, drainage structures and ditches, and replacing culverts to effectively channel storm runoff during 100-year-flood events, in compliance with the LRMP (p. IV-49) (ML 1-5).
- Reshaping slopes and stabilizing eroding soils to lower non-point source pollution into waterways, in compliance with the Clean Water Act; thereby lowering environmental stressors to aquatic habitats to aid listed salmon species recovery on all roads (ML 1-5).

Minimizing damage to soil, aquatic and watershed resources.

There is a need for rectifying or improving drainage infrastructure along select road segments and motorized trails on the NFTS to reduce moderate and high rates of soil erosion and sedimentation degrading water quality. Particularly where roads are located on highly erosive soils, geologically unstable and/or steep slopes or near streams, there is a need for surface improvements, culvert upgrades, and culvert redesign to promote fish passage and clean water.

Minimizing damage to vegetation and other forest resources.

There is a need for reducing the potential introduction and spread of Port-Orford-cedar root disease (*Chamaecyparis lawsoniana;* POC) root disease, caused by the non-native pathogen *Phytophthora lateralis* (PL), from continued motorized use of NFTS roads and trails, a known vector to carrying soils containing POC disease to uninfected POC forested areas. Port-Orford-cedar are considered an ecologically, economically, and culturally important tree species (FSM 2670.22). The agency's recommendation in the *Smith River NRA RAP/OHV Strategy* is to restrict travel to the dry season, avoid direct contact with vehicle tires and prohibit use in infected areas altogether. Road decommissioning, UAR restoration and barricading, seasonal gate closures and gravelling are necessary activities to slow the spread of PL.

Figure 1-6. McDonalds rockcress—an herbaceous perennial forb.

There is a need for lessening undesirable effects from unmanaged OHV use to botanical ecosystems, as foliage could be crushed and whole plants uprooted by OHV vehicle tires. Over-collection, introduction of exotic weeds dust, change in hydrology, increased erosion and compaction can put pollinators at-risk to slow or eliminate plant growth and reproduction (Trombulek and Frissell 2000). This is affecting habitats known for their diversity of federally-listed, endangered McDonalds rockcress, depicted in Figure 1-6, growing in ultramafic rock crevices (serpentine) and bare slopes of steep, Forest

Service-listed (Region 5) sensitive plants such as the Howells jewel-flower, and SRNF's watch-list plant species (36 CFR 294.1).

Keeping OHV travel to designated roads and motorized trails, road closures and restoration of drainage patterns on select UARs is key to maintaining the viability of endemic, uncommon plants that can grow, some thriving, on the ultramafic soils.

Other Considerations

The SRNF will also consider the following, when making any limited changes to NFTS roads:

- Minimizing harassment of wildlife and significant disruption of wildlife habitat.
- Minimizing conflicts between motor vehicles and existing or proposed recreational uses of NFS lands or neighboring federal lands.
- Minimizing conflicts among different classes of motor-vehicle uses on NFS lands or neighboring federal lands.
- Compatibility of motor-vehicle-use with existing conditions in populated areas, taking into account sound, emissions, and other factors.
- Speed, volume, composition and distribution of traffic on roads.
- Compatibility of vehicle class with road geometry and surfacing.
- Maintaining valid existing rights of use and access (rights-of-way).

The Proposed Action, Modified Proposed Action & Preferred Alternative

The Proposed Action, Alternative 2, represents the starting point for proposed limited changes to the NFTS, based on the collaborative group recommendations from 2010, as described in the Notice of Intent (NOI) published in the April 20, 2012 *Federal Register* (Vol. 77, No. 77, pp. 23658).

Alternative 3, the modified Proposed Action, was developed in response to comments received during tribal consultation prior to the publication of the Notice of Availability (NOA) of the DEIS in the *Federal Register* (Vol. 79, No.70, pp. 20197) on April 11, 2014. This modification solely targets the exclusion of TCPs within the Project Area, nominated or listed on the NRHP, to avoid potential effects to sacred sites and cultural values within them, until a more in-depth tribal consultation process can be conducted in the future. Both Alternatives 2 and 3 were eliminated from further detailed analysis in the FEIS (see *Alternatives Considered, but Eliminated from Detailed Study* section for more information).

Alternative 6, the agency-Preferred Alternative, addresses significant issues in the DEIS, incorporating the collaborative group's recommendations on key routes from Alternative 2, and Alternative 3's avoidance of TCP impacts, with minor modifications in response to public comments on the DEIS.

Alternative 6 would downgrade 15 miles of ML 3 roads to ML 2 roads to allow for motorized recreation opportunities that integrate with Del Norte County roads; designates parking at 4 sites along

17N49; barricades and restores drainage patterns on 93 miles of UARs; stormproofs 106 miles of roads and motorized trails; repairs a structurally unsound bridge; and authorizes 18 additional seasonal gates to allow use of NFTS roads and motorized trails in the dry season. Alternative 6 requires a non-significant forest plan amendment to change semi-primitive non-motorized to semi-primitive motorized in the ROS. A detailed description of Alternative 6 is located in Chapter 2 of this FEIS. Maps depicting the Proposed Action are described in the catalog of maps included with this document.

Decision Framework

Given the purpose and need, the deciding official will review the alternatives and their environmental consequences to determine whether to implement the preferred alternative, select another action alternative, or take no action at this time.

All action alternatives require a project-specific forest plan amendment to authorize motorized public access to a popular dispersed recreation site near Blackhawk Bar (MA-4); presently designated as semi-primitive non-motorized in the ROS.

Forest Plan Direction

The 1994 Six Rivers National Forest Land and Resource Management Plan (SRNF LRMP) and Record of Decision (ROD) (hereafter referred to as the Forest Plan), identifies land allocations as illustrated in Figure 1-7, which divide National Forest System (NFS) lands into management areas, each with a unique resource goal or emphasis.

Resource Goals, Desired Conditions, and Standards and Guidelines

Each management area prescribes a set of standards and guidelines, which provide direction to achieve future desired conditions.

The Forest Plan outlines management direction related to roads and motorized trails, as well as resource protection and watershed restoration related to road and motorized trail use and management. The resource goals, desired conditions, standards and guidelines, and the management area direction outlined below presents the goals, direction and forest-wide standards and guidelines relevant to this project.

As part of the Northwest Forest Plan Aquatic Conservation Strategy (ACS), key watersheds are intended to provide a system of large refugia that are crucial to at-risk fish stocks and provide high water quality. Guidelines for managing key watersheds are found in this section, including the specific requirement of *no net gain* in road miles. Forest standard and guideline 9-17 (p. IV-111) states that watershed restoration should focus on removing and upgrading roads.

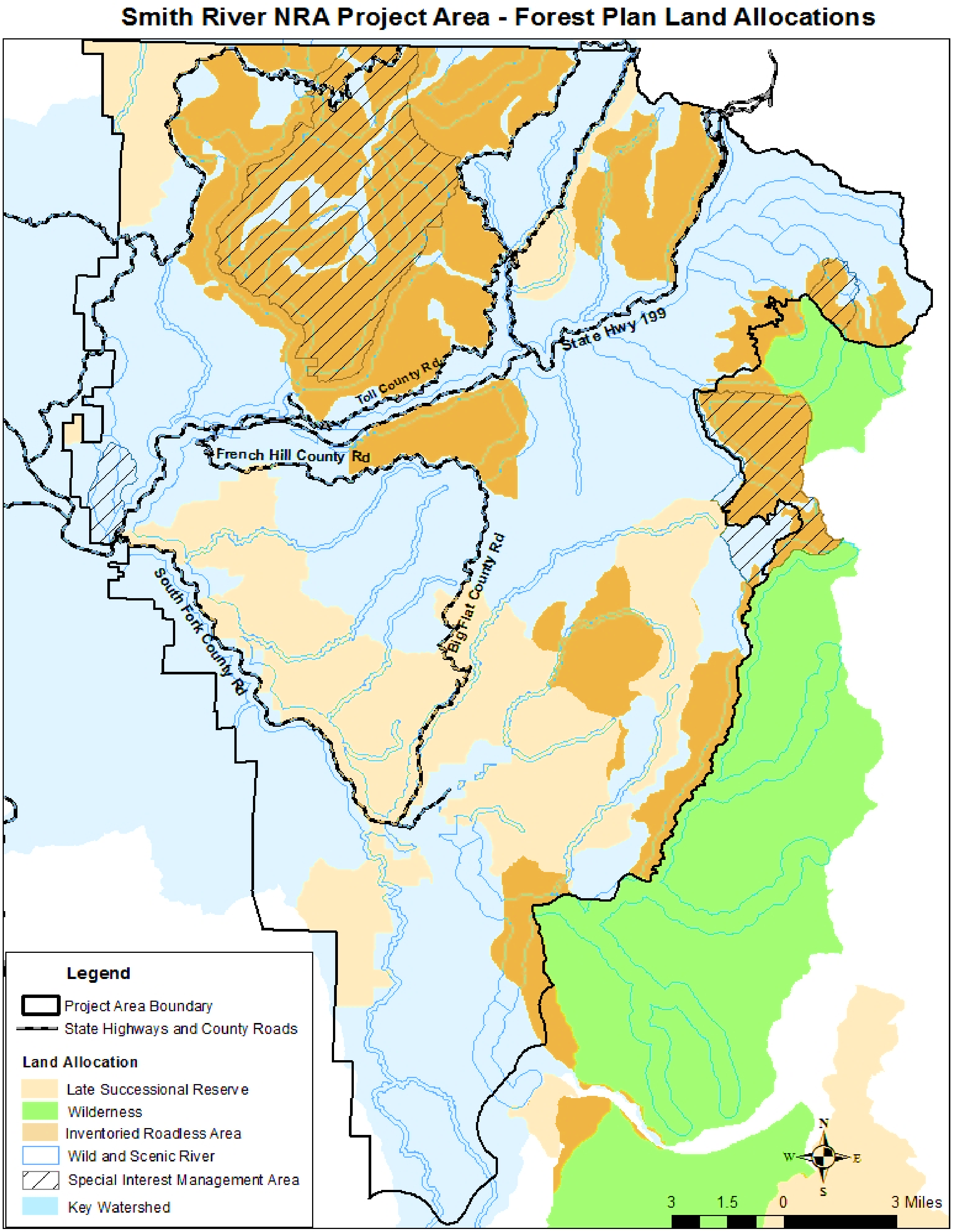

Figure 1-7. Forest Plan Allocation Map.

Federally Listed Species

Projects will be assessed through biological assessments to determine if management activities would have impacts on species listed under the Endangered Species Act. Northern spotted owl, marbled murrelet and coho salmon are listed as threatened while McDonalds rockcress is listed as endangered. All known populations and their occupied habitat will be protected from negative impacts associate with forest management activities (p. IV-83 standard and guideline 6-1).

Forest Service Sensitive Plant Species

Projects will be assessed through a biological evaluation to determine if management activities would have effects on sensitive fish, wildlife or plant resources. For Sensitive plant species, after completion of the evaluation, proposed actions will be prohibited if they are found likely to jeopardize the continued existence of the species or the maintenance of viable population throughout their existing range. (p. IV-83 standard and guideline 6-2).

Transportation and Facilities

The SRNF's goals are to provide a safe, efficient and cost-effective transportation system as well as provide public access for the use and enjoyment of its natural resources. Forest standard and guidelines 13-1 through 13-15 guide management for roads, trails and facilities. (pp. IV-115 and 116).

Recreation

Forest Plan standards and guidelines for recreation (pp. IV-122 and 124) include the goal to develop designated motorized recreation routes on existing roads and trails, and expand opportunities by creating partnerships with user groups and other agencies. Forest Plan standards and guidelines18-21 to 18-27 are specifically designed for motorized recreation. The first five standards and guidelines on page IV-124 are particularly relevant to the Proposed Action:

- **18-21** – OHV use is restricted to designated routes.
- **18-22** – Level 2 roads are open to motorized recreation vehicles (including OHVs) unless otherwise designated closed.
- **18-23** – Roads and trails emphasized for motorized recreation will be signed.
- **18-24** – Road, trail, or area use may be further restricted or prohibited by order of the Forest Supervisor if necessary to provide for public safety, prevent resource damage, or otherwise serve the public interest.
- **18-25** – Closed roads will be evaluated for obliteration, restoration, and rehabilitation.

The Recreation Opportunity Spectrum (ROS) is a system for classifying and managing recreation based on a combination of the physical setting, the social setting, and the managerial setting.

Pest Management and Port-Orford-Cedar

The goal of POC root disease management (pp. IV-129-130) is to minimize resource damage from insects, disease, plants, and animals to help achieve resource objectives, and to minimize resource damage through integrated pest control. The Forest Plan directs the forest to conduct a formal analysis and prescription for controlling the spread of POC root disease, caused by the non-native pathogen *Phytophthora lateralis*, for any activity that has a potential for spreading this disease to POC. Standards and guidelines for the management of POC root disease are included in standard and guideline 20-6 to 20-10. Of particular importance to this project is an element of standard and guideline 20-7 that states that transportation plans will evaluate the risk of spread of disease through road upgrades, seasonal closures, permanent closures, maintenance and decommissioning.

Lands

Of particular relevance to this project is standard and guideline 15-5 (p. IV-118), which states that rights-of-way needed for public access must be acquired in advance of scheduled programs.

Cultural Resources

The SRNF's goals related to cultural resources include identifying, evaluating, and providing for public appreciation of cultural resources on NFS lands. The forest also maintains a well-balanced heritage resource program in the areas of prehistory, history, ethnography, and contemporary values. It also includes the recognition of the contemporary values of the Native Americans who use the forest, and provide positive resolution where other resource uses conflict with those values. Standards and guidelines within the Forest Plan for cultural resources are identified in 12-1 to 12-4 (p. IV-114).

Management Areas

A management area represents lands that will be managed in a uniform manner, through a set of management area prescriptions unique to that area. The following management areas and associated direction occur within the project area:

Management Area 2

Wild River.

This management area includes segments of the Smith River and adjacent corridors of land classified as *wild* under the National Wild and Scenic Rivers Act of 1968. Goals include preserving wild river qualities reserved for rivers that are free-flowing and generally inaccessible except by trail. The desired condition is for the river to appear essentially primitive, with little or no evidence of human activity. Standards and guidelines related to this project for this management area include:

- ***Recreation***
    - Manage primarily for ROS class semi-primitive non-motorized. Simple comfort and convenience facilities, such as fireplaces, may be provided as necessary within the river area.
    - Motorized travel on land will occur only on existing routes. No new routes will be constructed.

- ***Transportation and Facilities Management***
  - No new roads or facilities for motorized travel will be constructed. Minor existing structures may be allowed if compatible with the essentially primitive and natural values of the viewshed.

Scenic River.

This management area includes segments of the Smith River and adjacent corridors of land classified as *scenic* under the National Wild and Scenic Rivers Act of 1968. The basic distinctions between a wild and a scenic river are degree of development, type of land use and road accessibility. The goals are to maintain and enhance the outstandingly remarkable values for which the rivers are designated and provide recreational opportunities that do not adversely impact or degrade those values. The desired condition for scenic river segments is that it appears to be in a natural forest condition as seen from the river. The river area will appear largely primitive, and shorelines will be largely undeveloped. Standards and guidelines related to this project for this management area include:

- ***Recreation***
  - Maintain existing ROS class of semi-primitive non-motorized and semi-primitive motorized. Larger scale public use facilities, such as moderate size campgrounds, public information centers, and administrative headquarters are allowed, if such structures will be visually screened from the river.
- ***Transportation and Facilities Management***
  - Roads may occasionally bridge the river area. Short stretches of conspicuous roads and longer stretches of inconspicuous roads are allowed within the river corridor.

Recreational River.

This management area includes segments of the Smith River and adjacent corridors of land classified as *recreational* under the National Wild and Scenic Rivers Act of 1968. The recreational classification applies to those river segments that are readily accessible by public roads and have experienced substantial human modification to the scenery. The desired condition is that it should generally remain natural and riverine in appearance. Standards and guidelines related to this project for this management area include:

- ***Recreation***
  - Manage for ROS classes roaded natural, semi-primitive motorized, and semi-primitive non-motorized. Campgrounds and picnic areas may be established in close proximity to the river.
- ***Transportation and Facilities Management***
  - Roads and trails may be constructed. Bridge crossings and numerous river access points may occur.

Management Area 5 – Research Natural Areas

Research natural areas (RNAs) are part of a national network of field ecological areas designated for non-manipulative research, observation, and to study and maintain biological diversity on NFS lands. Research natural areas are established: 1) to preserve a wide spectrum of pristine, representative areas that typify target vegetation types and/or types considered of scientific interest; 2) to serve as control areas for comparing landscapes manipulated by humans; 3) to serve as baseline areas for measuring long-term ecological change; and 4) to preserve and maintain genetic diversity and to provide a laboratory for the study of ecological succession. Management actions proposed in an RNA are coordinated with the Pacific Southwest Research Station.

Management Area 7 – Smith River National Recreation Area

The Smith River NRA was established in November of 1990, by SB 2566/HB 4309, to emphasize, protect, and enhance the unique biological diversity; anadromous fisheries; and the wild, scenic, and recreational potential of the Smith River while providing sustained yields of forest products. The Smith River NRA Act legislated specific statutes. The *Smith River NRA Management Plan* (Forest Plan Appendix A) provides direction to guide compliance with those statutes:

Smith River NRA Management Plan.

The following describes sections of the *Smith River NRA Management Plan* relevant to this Proposed Action. Much of the plan underscores the basis of the Purpose and Need of the Proposed Action:

- ***Management Areas.*** While specific management direction is identified for each of the eight management areas (pp. 20-39), management direction that is common to all management areas and related to the Proposed Action follows:
    - Provide for a broad-range of recreation uses and provide recreational and interpretive services and facilities (including trails and campgrounds) for the public.
    - Provide and maintain adequate public access, including vehicular roads for general recreational activities such as camping, hiking, hunting and fishing.
    - Improve the anadromous fishery and water quality, including (but not limited to), stabilizing landslides, improving fish spawning and rearing habitat, and placing appropriate restrictions or limitations on soil-disturbing activities.
    - Permit the use of OHVs only on designated routes.
    - Provide for the long-term viability and presence of POC and ensure its continued present economic and non-economic uses through implementation of management strategies developed by the Forest Service.
    - Provide for the restoration of landscapes damaged by past human activity consistent with the Smith River NRA Act.

    The North Fork Management Area contains directions for OHV use stating that this area also contains most of the historic mines and mining roads found in the Smith River NRA. The abundant access of these roads provide, along with the unusually erosion resistant soils, provide an excellent opportunity for managed OHV use. Specific direction states that the Smith River NRA shall provide and maintain facilities for information services and recreation activities that are compatible with the wild, scenic, or recreational river designations, including hiking, camping, white water boating, OHV use on designated trails, and hunting.

- ***Ten-Year Plan***
  - The Recreation Plan (p. 40) recommends the forest designate routes for OHV use and facilities.
  - The Fisheries and Riparian Plan states that all fisheries and riparian work will be coordinated to:
    - Maintain the function of corridors and manage for watershed-stream integrity by correcting road and culvert failures, controlling landslides and fine sediment sources, and maintaining sources of large woody debris for channel stability and stream habitat complexity.
  - Under the Soil and Watershed Improvements and Activities plan (p. 44), the following is prescribed:
    - Conduct road inventory, evaluation, and reclamation:
      - Conduct a comprehensive inventory of all roads within the NRA.
      - Evaluate each road with regard to use or potential use for recreation, timber management, access to private land, and for the road system's effects on watershed, wildlife, and recreational values.
      - Determine long-term management of each road. Develop a schedule for closure and reclamation of unneeded or inappropriate roads.
    - Monitor soil and water resources. Such monitoring efforts will include the following activities:
      - Monitor impact of OHV use on water quality in areas with designated OHV routes.
    - Evaluate flood risk:
      - Conduct a flood risk rating of all road drainage structures.
      - Develop a plan for "flood proofing" all roads.

Management Area 8 – Special Habitat (Late-Successional Reserve)

Late-successional reserves are managed to protect and enhance conditions of late-successional and old-growth forest ecosystems, which serve as habitat for late-successional and old-growth-related species, including the northern spotted owl. These reserves are designed to maintain functional, interacting, late-successional and old growth ecosystems. Recreational uses standards and guidelines state to use adjustment measures, such as education, use limitations, traffic-control devices, or increased maintenance when dispersed and developed recreation practices retard or prevent attainment of late-successional reserve objectives. In addition, motor-vehicle use would be restricted to designated routes. Road and trail density would be at low to moderate levels. High standard roads would generally not occur; however, ML 1 or 2 roads would occur (Forest Plan, pp. IV-42 to IV-43).

Management Area 9 – Riparian Reserves

Under the Aquatic Conservation Strategy, riparian reserves are used to maintain and restore riparian structures and functions to streams, confer benefits to riparian-dependent and associated species other than fish, enhance habitat conservation for organisms that are dependent on the transition zone between upslope and riparian areas, improve travel and dispersal corridors for many terrestrial animals and plants, and provide for greater connectivity of the watershed. The riparian reserves serve as connectivity corridors between late-successional reserves.

Management Area 10 – Special Interest Areas, Botanical Area

Botanical areas are classified under 36 CFR 294.1 and managed for the full complement of the species and plant communities, as well as the natural processes that support these elements. These areas include some of the best examples of indigenous and sensitive plant concentrations, sensitive plant habitat, conifer diversity and unique plant communities on the forest:

- **Myrtle Creek Botanical Area.** This botanical area was established to represent an ecotone between the redwood forest type and the mixed evergreen forest, and to display the cultural history of the area.
- **North Fork Smith River Botanical Area.** This botanical area was established because of the large number of rare and endemic plant species, distinctive plant habitats, and plant communities.
- **Bear Basin Botanical Area.** This botanical area harbors forest communities of exceptional conifer diversity.
- **Broken Rib Ecological Area.** The ecological area was established because of its high botanical and ecological diversity.

Principle Laws and Regulations

The National Environmental Policy Act of 1969 (NEPA).

The National Environmental Policy Act of 1969 requires that all major federal actions significantly affecting the human environment be analyzed to determine the magnitude and intensity of those impacts, the results be shared with the public, and the public given opportunity to comment. The regulations implementing NEPA further require that to the fullest extent possible, agencies shall prepare EISs concurrently and integrated with environmental analyses and related surveys and studies required by the Endangered Species Act of 1973, the National Historic Preservation Act of 1966 (NHPA), and other environmental review laws and executive orders. Principle among these are the Multiple Use and

Sustained Yield Act of 1960, the National Forest Management Act of 1976 (NFMA) as expressed through the Forest Plan, the Clean Air Act of 1955, the Clean Water Act of 1948, and the Forest and Rangeland Renewable Resources Planning Act of 1974.

2005 Travel Management Rule (36 CFR 212, 251, 261, and 295).

The *Smith River National Recreation Area Restoration and Motorized Travel Management EIS* is designed specifically to implement the requirements of the 2005 Travel Management Rule, Subparts A and B. In making any limited changes to the NFTS in the revision process, the Responsible Official will consider the following criteria contained in Subpart B of the final travel management rule for designating roads and motorized trails on the NFTS:

- Impacts to natural and cultural resources.
- Public safety.
- Access to public and private lands.
- Availability of resources for maintenance and administration of roads, trails and areas that arise if the uses under consideration are designated.
- Minimizing damage to soil, watershed, vegetation, and other forest resources.
- Minimizing harassment of wildlife and significant disruption of wildlife habitat.
- Minimizing conflicts between motor vehicles and existing or proposed recreational uses of NFS lands or neighboring federal lands.
- Minimizing conflicts among different classes of motor vehicle uses of NFS lands or neighboring federal lands.
- Compatibility of motor vehicle use with existing conditions in populated areas, taking into account sound, emissions, and other factors.

When making any limited changes to NFTS roads, the Responsible Official will also consider the following:

- Speed, volume, composition and distribution of traffic on roads.
- Compatibility of vehicle class with road geometry and road surfacing.
- Maintaining valid existing rights of use and access (rights-of-way).

Smith River National Recreation Area Act of 1990.

Section four of the Smith River NRA Act (Public Law 101-612) describes the purpose of the establishment of the Smith River NRA:

> *For the purposes of ensuring the preservation, protection, enhancement, and interpretation for present and future generations of the Smith River watershed's outstanding wild and scenic rivers, ecological diversity, and recreation opportunities while providing for the wise use and sustained productivity of its natural resources, there is hereby established the Smith River National Recreation Area.*

The Act mandates a need to provide for recreation opportunities that are of the type and levels consistent with preservation, protection, and enhancement. The first four provisions of Section 5 of the Smith River NRA Act serve as a basis for the project's need. They are:

- Provide for a broad range of recreation uses and provide recreational and interpretive services and facilities (including trails and campgrounds) for the public.
- Provide and maintain adequate public access, including vehicular roads for general recreational activities such as camping, hiking, hunting, and fishing.
- Improve the anadromous fishery and water quality, including (but not limited to) stabilizing landslides, improving fish spawning and rearing habitat, and placing appropriate restrictions or limitations on soil disturbing activities.
- Permit the use of off-road vehicles only on designated routes.

These four provisions include recreation opportunities and access, fish and watershed protection and restoration, and management of off-road vehicles. The Proposed Action is designed to meet these four provisions by managing motorized recreation opportunities at a level and manner that are appropriate and consistent with resource protection.

Public Involvement

Collaboration

The 1990 Smith River NRA Act restricted motorized travel to designated routes, i.e. existing NFTS roads and motorized trails. Consistent with the *Smith River NRA Management Plan*, the forest completed the TAP in 2005 to determine long-term access needs along with management recommendations for every road and UAR administered by the district.

In 2007, the SRNF completed an environmental assessment (EA) to analyze the proposed limited changes to the NFTS, based on recommendations derived from the TAP. The Decision Notice for the *Smith River Road Management and Route Designation* project was signed in April 2007, but was appealed and reversed. A second Decision Notice was issued in September 2007, which removed nine routes from IRAs identified for designation to the NFTS in the April decision. This decision was also appealed and reversed on issues related to the designation of routes within IRAs.

In 2009, the SRNF published an MVUM for the Smith River NRA, which reflects the status of NFTS roads and motorized trails in the forest's transportation database at the time of publication in 2009.

In 2010, the SRNF entered into an interagency agreement with the US Institute for Environmental Conflict Resolution Program, who contracted with the Center for Collaborative Policy, to collaborate with appellants and interested stakeholders. The purpose was to bring interested parties together to share relevant information, discuss interests relative to travel management, and work together to develop recommendations to carry forward in a Proposed Action that makes changes to the NFTS and subsequent MVUM.

Three meetings and one field trip were held on April 15, July 22, October 6, and November 6, 2010, respectively. Participants included tribal representatives, Del Norte County elected officials, representatives from two OHV clubs, representatives from three environmental groups, and other interested individuals.

The management actions identified in the April 2007 Decision Notice was the starting point for the group to begin discussing relevant issues and concerns. The group decided to develop recommendations on the nine UARs that represented the difference between the first and second Decision Notice. After field review and discussions, the collaborative group recommended all or portions of eight of the nine UARs, referred to here as *key routes*, be carried forward in the Proposed Action. The collaborative group's recommendation, which includes the actions defined in the April 2007 Decision Notice, as amended by recommendations on nine key routes, as well as monitoring, was incorporated in the Proposed Action. In some cases, updates to the Proposed Action were necessary so that it is 1) within the legal and regulatory framework of the forest to implement; 2) based on up-to-date corporate data; and 3) compliant with Forest Service policy and direction. Recommendations about the key routes were carried forward in the Proposed Action and Preferred Alternative, as designed by the collaborative group.

In February 2010, the Smith River NRA scoped the Proposed Action in anticipation of completing an EA. The district received over 600 scoping comments. Due to the level of interest on the project and the controversy over the project's effects, the Responsible Official decided to pursue the environmental analysis of the project through an EIS, which determines if there are any significant effects. The Forest Service initiated formal government-to-government consultation with the Smith River Rancherias on February 27, 2012, and with the Yurok Tribe, Elk Valley, Karuk, Resighini, Tolowa Nation on February 28, 2012.

Scoping

A Notice of Intent (NOI) to prepare an EIS for the *Smith River National Recreation Area Restoration and Motorized Travel Management* project was published in the April 20, 2012 *Federal Register* (Vol. 77, No. 77, pp. 23658), with a 45-day scoping period, ending June 4, 2012. The Forest Service mailed the scoping summary and Proposed Action maps to 176 interested individuals and organizations, along with a cover letter requesting that the public identify their project issues and concerns.

Two public meetings, one at the Lighthouse Inn in Crescent City and the other at the Gasquet Mountain School in Gasquet, were held to inform the public about the project, clarify any specific questions the public had, solicit comments, and assist the public in understanding the information displayed on the Proposed Action maps or contained in the Proposed Action summary. Approximately 627 comments on the Proposed Action were received during the scoping period.

In August 2013, the SRNF hosted a public meeting to share the results of public scoping. The meeting included a presentation on the significant issue and proposed alternatives, and provided an opportunity for resource specialists and the public to talk about topics of concern. A debriefing of the resources specialists regarding issues brought forward by the public at the meeting found that there were no new issues that had not been previously identified through scoping. Information gleaned from discussions with the public was used to refine the alternative descriptions and maps in the DEIS.

County Coordination

The final travel management rule (CFR 212.53) states that the Responsible Official shall coordinate with appropriate federal, state, county and other local government entities and tribal governments when designating NFS roads, trails, and areas on NFS lands pursuant to this subpart. The SRNF has been timely in communicating with the Del Norte County Board of Supervisors regarding the project, by sharing draft documents and considering and responding to issues identified by the county through a series of two-by-two meetings. The Preferred Alternative incorporates recommendations provided, in part, by representatives on the Board of Supervisors during the 2010 collaborative process. Since then, the Forest Service identified a strategy to continue coordination efforts with Del Norte County through a series of two-by-two meetings, which included county supervisors Mike Sullivan and Gerry Hemmingsen, the Del Norte County sheriff, the SRNF forest supervisor and the Smith River NRA district ranger. The objective was to create an open dialogue, whereby the travel management process is understood and issues of concern are identified early in the planning process.

The SRNF met with a Board of Supervisors representative in two-by-two meetings eight times, including one field trip, and provided two presentations to the Board of Supervisors since deciding to analyze the project through an EIS. The forest provided the county a 30-day review period of the Proposed Action prior to public scoping, and shared the draft alternatives with county representatives prior to the release to the public. In response to concerns identified by the Board of Supervisors and the Del Norte County sheriff, the forest pursued inventorying short UARs to dispersed recreation sites for consideration in the project alternatives, surveying sites for parking near the proposed motorized trail network on 17N49, and responded to changes in terminology used in the analysis, for example, the term *restoration* was clarified as *restoration of drainage patterns* in the environmental analysis documents, and the phrase referring to *adding routes to the NFTS* was changed to *designating routes on the NFTS*.

The Responsible Official also expanded the scope of the project between the draft and final EIS to coordinate the management of the NFTS with the county road system in relation to this project's Purpose and Need. At the time the DEIS was released, state, county, and Smith River NRA ML 3, 4, and 5 roads were not being considered in this analysis; however, the Del Norte County Board of Supervisors has since passed the Del Norte County Rural Recreational Roads Ordinance, on October 28, 2014, which provided for OHVs, further defined in the ordinance as motorized wheeled vehicles that are not licensed for on-highway use, as well as highway licensed vehicles while operating off-highway on specific county roads. The Board of Supervisors then requested during the comment period that the forest supervisor consider providing mixed-use travel on specific ML 3 roads. The Responsible Official expanded the scope of the project, for the purposes of coordinating with Del Norte County road management, to consider a limited number of ML 3 roads for downgrading to ML 2 to accommodate mixed-use (i.e. both highway and non-highway licensed vehicles), when road surface type, use levels and road geometry were compatible.

The SRNF considered the goals and policies in the Del Norte County General Plan during preparation of the EIS. On October 25, 2011, the forest presented Board of Supervisors representatives a summary of its review of general plan with respect to its consistency with the Proposed Action. The forest provided a four-page document that outlined the goals and policies of the Del Norte General Plan identified by the forest as relating to and being consistent with the *Smith River National Recreation Area Restoration and Travel Management* project. Policies were consistent on water resources, onshore fisheries resources, soil resources, wildlife habitat resources, listed species, forestry resources, federal and state lands, safety, economic development, county parks and recreation, the Smith River NRA, recreational trails, public river access, cultural resources, county recreation areas, recreation resource areas, and transportation and circulation. The forest found that the Proposed Action was consistent with the county's general plan and shared this with the Board of Supervisors at the October 25, 2011 meeting. The forest continues to coordinate with the county by considering and responding to concerns identified by the county during FEIS preparation.

Comments on the DEIS

On April 11, 2014, the forest initiated the 60-day comment period on the DEIS with the publication of the Notice of Availability in the *Federal Register* (Vol. 79, No.70, pp. 20197). An opportunity to comment on the DEIS was published in the Eureka Times-Standard, on April 12, 2014, as well as on the forest's website. The forest received 854 comments during the comment period, including comments from Del Norte County Board of Supervisors, the Smith River Alliance, the Northwest Trail Riders, the Blue Ribbon Coalition, the Klamath-Siskiyou Wildlands Center, the Del Norte Resource Advisory Committee, the Deschutes County 4 Wheelers, the Four Runners of Klamath Falls, the Pacific Northwest Four Wheel Drive Association, PacifiCorp, ADH Environmental, the US Environmental Protection Agency (EPA), the USDI Office of Environmental Policy and Compliance, and 841 individuals.. During this timeframe, the large majority of the letters were form letters or form plus letters (i.e. minor changes to the form letter) at 741 letters generated from three master form letters. Seventy letters were unique and forty letters were duplicates of other letters.

Some commenters identified additional alternatives to consider. In such cases, the alternative was preliminarily analyzed to determine if it had already been considered in another alternative analyzed in detail; it met the purpose and need of the project, or responded to a significant issue; it was within the scope of the project; and whether it provided something unique that had not been considered in another alternative. In such cases where alternatives met these conditions, they were incorporated into one or more action alternatives.

Also important in this process was the information gathered by the Forest Service in their consultation and discussions with tribal representatives, local counties, and forest staff. State and federal agencies advised the process through numerous informal contacts. The resulting alternatives incorporate the proposals and information offered by the public and through interagency and government-to-government consultation when it responded to the purpose and need or addressed a significant issue, and was consistent with law, policy and regulation, and complied with the Forest Plan.

A compilation of public comments received during the DEIS comment period and the response to these comments is located in Appendix G of the FEIS. Comments received during the scoping period are located in the project record at the Six Rivers National Forest Supervisor's office, in Eureka, California, and are available for review upon request.

Issues

Comments from the public, other agencies, local government representatives, and regional Native American tribes were used to define issues concerning the proposal and alternatives. The Forest Service separated the issues into two groups: significant and non-significant. Significant issues were defined as those having the potential for adverse effects from implementation. Non-significant issues were identified as those: 1) outside the scope of the Proposed Action; 2) already decided by law, regulation, Forest Plan, or other higher-level decision; 3) irrelevant to the decision to be made; or 4) conjectural and not supported by scientific or factual evidence. The Council on Environmental Quality (CEQ) NEPA regulations explain this delineation in §1501.7, "…identify and eliminate from detailed study the issues which are not significant or which have been covered by prior environmental review (§1506.3)…" A list of non-significant issues and reasons why they were found non-significant may be found in the scoping report on the project website (*www.fs.usda.gov/project/?project=38813*), or in the project record at the Six Rivers National Forest Supervisor's office, in Eureka, California.

As for significant issues, the Responsible Official identified the following issues through scoping:

1. ***Issue:*** *Closing roads and trails impacts motorized recreation opportunities.*

   Concerns were raised that the Proposed Action does not provide adequate access to dispersed recreation sites; the proposed closing of NFTS roads, and not adding or keeping more NFTS roads and motorized trails will reduce motorized recreation opportunity, increase user conflict, and decrease motorized access to the forest; and closing roads and trails reduces access to historic mining sites accessible by motorized vehicles. Alternatives 4 and 6 were developed to address this issue.

2. ***Issue:*** *Designating motorized trails in inventoried roadless areas impacts nonmotorized recreation opportunity and inventoried roadless area character.*

   Concerns were raised that the proposed addition of motorized trails will affect IRA characteristics of these areas, including opportunities for solitude, undisturbed landscapes and primitive, non-motorized recreation. The Proposed Action designates 3.1 miles (portions of 6 UARs) of additional motorized trails in these areas. Opportunities for solitude and primitive non-motorized experiences would be negatively impacted by the noise and disturbance of vehicles. Motorized trails change the character of these otherwise undisturbed landscapes. Alternative 5 was developed to address this issue.

3. ***Issue:*** *Public motorized use of roads and trails will impact forest resources.*

   Many commenters expressed concerns about impacts to a variety of natural resources including water quality, wildlife, and soils for example. In particular, impacts to botanical resources (threatened and endangered, and sensitive species) will result from allowing motorized use and ineffective mitigation on routes proposed for designation. Impacts to botanical resources will result from the introduction and spread of noxious weeds due to motorized use. Port-Orford-cedar is threatened by the potential introduction and spread of POC root disease, due to allowing motorized use and ineffective mitigations on routes. Alternatives 5 and 6 were developed to address this issue.

4. ***Issue:*** *Changing the existing NFTS within traditional cultural properties nominated or listed on the National Register of Historic Places may impact sacred sites and cultural values of regional tribes.*

Commenters expressed concerns that changes to the NFTS within TCPs may impact sacred sites and cultural values of regional tribes. The Proposed Action (Alternative 2) was eliminated from detailed study. The Proposed Action was modified (Alternative 3) including identical proposed activities outside portions of the Project Area identified as having potential to effect TCPs in response to this issue. Alternatives 4, 5 and 6, developed in response to comments on the DEIS, also exclude portions of the Project Area to avoid effects to TCPs.

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Chapter 2. Alternatives, including the Proposed Action

Introduction

This chapter describes and compares the alternatives considered for the *Smith River National Recreation Area Restoration and Motorized Travel Management Final Environmental Impact Statement* (FEIS). The Forest Service fully analyzed the No Action alternative and developed three action alternatives 4, 5 and 6, that uniquely respond to the purpose and need, and the significant issues and recommendations submitted by the public. In addition, the Forest Service analyzed a No Action Alternative 1. The chapter is divided into four parts:

- Part 1 describes how the alternatives were developed.
- Part 2 describes in detail the No Action, Preferred Alternative 6, and action Alternatives 4 and 5.
- Part 3 presents the alternatives that were considered, but eliminated from detailed analysis. It includes the rationale for eliminating these alternatives.
- Part 4 compares the alternatives based on their actions, and environmental, social, and economic consequences. This section includes a comparative display of the predicted effects of the alternatives in tabular format.

Changes between Draft and Final Environmental Impact Statement

Following the distribution of the 2012 *Smith River National Recreation Area Restoration and Motorized Travel Management Draft Environmental Impact Statement* (DEIS), minor grammatical changes and reorganization of some sections were made to the FEIS to improve clarity for the reader, along with corrections to address inadvertent technical and transportation atlas errors and incorporation of new information. These following changes are identified below, organized and described by section heading.

- **Introduction.** Alternative 5 is identified as the environmentally preferable alternative, and Alternative 6 is the agency-preferred alternative.
- **How Alternatives were Developed.** This discussion was expanded to describe the development of the recommendations that provided the basis for the proposed action, and how alternatives were developed in response to scoping and public comments.
- **Alternatives Considered in Detail.** The discussion was expanded and includes summarized scoping and public comments. Corrections to the National Forest Transportation System (NFTS), when identified, were incorporated in the alternatives where applicable and are listed on a route-specific basis in this section and in Appendix A.

All Action Alternatives

Concerns identified by commenters listed in all the action alternatives include:

Mixed Use

Consideration of more mixed use was added to all the action alternatives in response to comments and changed circumstances regarding the management of Del Norte County roads. Del Norte County passed a resolution allowing mixed use on county roads. Forest Road 17N07 and 4.9 miles of 17N49 (downgrading milepost 2.96 to junction of County Road 305 from ML 3 to ML 2), are proposed for downgrading to Maintenance Level (ML) 2 (roads for high-clearance vehicles) in all action alternatives as this road connects to existing mixed-use opportunities to provide a loop opportunity. The surface type, unpaved and condition of the road (low level of investment) are consistent with the mixed-use designation that would be allowed on ML 2 roads.

Administrative access and public safety

- Griffin Creek Bridge repair at milepost 0.0 on Forest Road 18N07 is considered in all action alternatives, as it was discovered through routine bridge inspection that the bridge has a cracked girder making it structurally unsound.
- Changed the barricade to a gate on UAR 17N49.4A to allow for search and rescue motorized access to the North Fork of the Smith River.

Risk reduction to forest resources

- Added a seasonal gate to mitigate risk to POC on the following NFTS roads: 17N36, 14N01D and 15N13.
- Added a barricade at the end of Forest Road 14N08 to reduce risk to uninfected POC stands. Decommissioned 14N38 past the water source.
- A barricade was added to the beginning of UAR 17N23C.1, which is proposed for designation on the NFTS as an ML 1 road.

Neighboring lands and private property access

- Unauthorized route 411.102 would not be designated or barricaded. This route provides primary access to a private inholding. The landowner will pursue applying for a special use permit to allow for motorized travel to their property.
- The barricade would be changed to a gate on UAR 15N13.100 in response to concerns from Green Diamond Resource Company, a neighboring landowner, whose road connects to this UAR. While the company does not have near term plans for using their road or the UAR that connects to it, they are concerned about how a barricade may increase initial response times in the event of a wildfire ignition. In response to this concern, the barricade was changed to a year-round gate.

Alternative 4 – Motorized Recreation Opportunity Alternative

Motorized recreation

In response to comments submitted by Del Norte County to provide for dispersed recreation, the Forest Service reconsidered UARs for designation as motorized trails, after completing surveys validating no sensitive plant species and/or the federally listed *Arabis macdonaldiana* were growing within the footprint or nearby. Consequently, the high-risk rating disclosed in the *Smith River NRA* RAP/OHV Strategy for these UARs was changed to a low risk rating. Alternative 4 was changed to include designating UAR 305.126 and the first 1,000 feet of UAR 315.100 as a motorized trail with a barricade at the end of the route.

Administrative access

Maintaining future administrative access drove the change to this alternative that includes designation of UAR 14N15.1 as an ML 1 road on the NFTS with a year-round gate, and to downgrade Forest Road 18N20 to ML 1 with a year-round gate. Forest Service Road 18N08F would remain an ML 2 road, but with a seasonal gate. The barricade on UAR 17N49.4A was changed to a gate to allow for search and rescue access.

Risk reduction to forest resources

- Added a year-round gate on UAR 15N01A.4, which is proposed for designation as ML 1, in response to concerns about infecting POC stands in a currently uninfected watershed.
- Removed the proposal to seasonally gate 17N49.101, which was downgraded to low risk after a field review found to have no POC occurring on the route.
- A review of existing gates found that 16N03K was already closed seasonally with a gate, and was therefore removed from the proposal for this road.
- Graveled the following UARs proposed for designation: 316.8, 15N36N.1B, 17N01.1A, 17N01.1B, 17N01.3, 18N07.14, 18N09.108, 199.113, 315.110, 315.111, 316.2, 316.3, 316.4, 316.5, 316.6, 316.9 and 427.108.
- Added route delineation mitigation to the following UARs proposed for designation on the NFTS: 316.7, 305.109, 305.118 and 16N02.1, and Forest Road 18N15.
- Added a barricade at the end of UAR 15N02.01, proposed for designation as a motorized trail, to reduce risk to uninfected POC stands.

Alternative 5 – Environmental Preferred Alternative

Risk reduction to forest resources

- High-risk ML 1 roads in uninfected watersheds would be decommissioned in response to public comments about minimizing risk to Port-Orford-cedar (POC), which include the following forest roads: 14N01D, 14N15, 14N38, 14N39, 15N02, 15N42, 15N45, 16N02G, 16N02L, 16N23, 16N31,

16N31B, 16N33, 16N33A, 17N04L, 17N29, 17N32, 17N32G, 18N15, 18N15A, 18N17, 18N17A, 18N17B, 18N17C, 18N17D, 18N17E and 18N17F.

- Graveled the following UARs proposed for designation on the NFTS: 199.102, 199.103, 199.104, 199.106, 199.113, 316.8 and 427.107.
- Unauthorized routes originally proposed as motorized trails that are occupied sensitive plant habitat are proposed for restoring in this alternative, including UARs 17N49.101, 17N49.102, 17N49.107, 17N49.109 and 17N49.13.
- Barricaded the last 50 feet of UAR 15N01.102, which is proposed as an ML 2 road to mitigate risk to POC stand.

Alternative 6 – Agency-Preferred Alternative

Motorized recreation

In response to comments submitted by Del Norte County to provide for dispersed recreation, the Forest Service reconsidered UARs for designation as motorized trails, after completing surveys validating no sensitive plant species and/or the federally listed *Arabis macdonaldiana* were growing within the footprint or nearby. Consequently, the high-risk rating disclosed in the *Smith River NRA* RAP/OHV Strategy for these UARs was changed to a low risk rating. Alternative 6 was changed to include designating UAR 305.126 and the first 1,000 feet of UAR 315.100 as a motorized trail with a barricade at the end of the route.

Risk reduction to forest resources

- Graveled the following UARs proposed for designation to mitigate risk to POC: 15N36N.1, 15N36N.1B, 16N23.2, 17N01.1A, 17N01.1B, 17N01.3, 18N02.3, 18N07.14, 18N09.108, 199.113, 315.110, 315.111, 316.1, 316.2, 316.3, 316.4, 316.5, 316.6, 316.9, 427.107 and 427.108.
- Added a year-round gate on UAR 15N01A.4, which is proposed for designation as ML 1, in response to concerns about infecting POC stands in a currently uninfected watershed.
- Added route delineation mitigation to Forest Road 18N15 to mitigate effects to botanical resources.
- Added a barricade at the end of UAR 15N02.01, which is proposed for designation as a motorized trail, to reduce risk to uninfected POC stands.
- Removed the proposal to seasonally gate 17N49.101, which was downgraded to low risk after a field review found to have no POC occurring on the route.
- A review of existing gates found that 16N03K was already closed seasonally with a gate, and was therefore removed from the proposal for this road.

Administrative access and public safety

Maintaining future administrative access drove the change to this alternative that includes designation of UAR 14N15.1 as an ML 1 road on the NFTS with a year-round gate, and to downgrade Forest Road 18N20 to ML 1 with a year-round gate. Forest Service road 18N08F would remain an ML 2 road, but with a seasonal gate. The barricade on UAR 17N49.4A was changed to a gate to allow for search and rescue access.

Alternatives Considered but Eliminated from Detailed Study

The discussion of the alternatives identified through public comment and why they were eliminated from detailed analysis was added. This includes Alternative 3, the modified proposed action.

Grammatical revision throughout this section to enhance clarity for the reader and the Route Designation for Search and Rescue Operations – Alternative considered but eliminated from detailed study section was deleted to remedy an inadvertent error, and addressed under alternatives considered in detail in the FEIS.

Comparison of Alternatives

The comparison of alternatives table was replaced to disclose effects in tabular format, based on the indicators presented in Chapter 3 of the FEIS.

How the Alternatives were Developed

The Forest Service process for developing alternatives began with the review of proposals brought forward in comments received, collaborative group recommendations and new information considering the resource risks and motorized access/use benefits in context of the significant issues.

Significant Issues

The Forest Service generated three action alternatives (Alternatives 4, 5 and 6), each having a unique emphasis and response to significant issues as follows:

- **Significant Issue:** Closing roads and trails impacts motorized recreation opportunities.
    - **Alternative 4** places emphasis on improving opportunities for motorized recreational riding and access on the NFTS, while minimizing effects from both the physical route footprint and OHV use.
    - **Alternatives 5** accommodates motorized recreational opportunities where not in conflict with resource protection and restoring undesirable resource effects from both the compacted physical route footprint and OHV use.

  - **Alternatives 6** accommodates motorized recreational opportunities where they access popular OHV riding areas and dispersed recreation sites[10], while protecting resources most at-risk from both the physical route footprint and OHV use.
- **Issue:** Designating motorized trails in inventoried roadless areas impacts nonmotorized recreation opportunity and inventoried roadless area character.
  - **Alternative 5** places emphasis on preserving roadless areas features and character without allowance for motorized public access in IRAs.
  - **Alternatives 4 and 6** accommodate low levels of motorized uses in IRAs, while minimizing effects to roadless features and character.
- **Issue:** Public motorized use of roads and trails will impact forest resources.
  - **Alternative 5** places emphasis on reducing the number of roads and UARs with specific attention given to protecting non-motorized recreation opportunities in IRAs and sensitive rare plant habitats, while minimizing undesirable effects to healthy Port-Orford cedar (POC) forests and other resources.
  - **Alternatives 4 and 6** minimize undesirable effects of OHV use on IRA, sensitive rare plant resources and healthy POC) forests and other resources.
- **Issue:** Changing the existing NFTS within traditional cultural properties (TCPs) nominated or listed on the National Register of Historic Places may impact sacred sites and cultural values of regional tribes.
  - **Alternatives 4, 5 and 6** exclude TCPs from consideration.

Smith River NRA RAP/OHV Strategy

Although each action alternative represents a unique set of proposed changes to the NFTS and range of restoration activities, the same overarching guidelines from the *Smith River NRA* RAP/OHV Strategy used by the Forest Service to develop the proposed action, modified proposed action and alternatives 4, 5, and 6, were applied as follows:

Unauthorized Routes

- Considerations for motorized trail designation to the NFTS are limited to UARs the Forest Service inventoried UARs that have high recreational value as identified by the public and/or the agency. Inventoried UARs are considered for designation only when: there are no resource concerns or user

[10] Dispersed recreation – The Forest Service considered public recommendations for designating access to dispersed recreation sites, including those identified in the letter dated September 12, 2012, and GIS data submitted by Del Norte County on September 25, 2012. During alternative development, the agency inventoried individual dispersed sites and access UARs to determine localized conditions and the agency's capability to mitigate resource impacts if designated to the NFTS. Alternatives 4, 5, and 6 provide a range of motorized access opportunities, which respond to their unique emphasis and the significant issue that closing roads and trails can impact motorized recreation experience. For instance, Alternative 4 includes designating 56 routes to dispersed recreation sites, whereas Alternatives 5 and 6 would designate 11, and 52 motorized trails respectively.

conflicts; they are rated as either low or moderate risk rating to resources; and they are rated as high risk to resources, but mitigation (s) would effectively reduce effects to resources to an acceptable level (Smith River NRA RAP/OHV Strategy). Those UARs considered for motorized trail designations where there are sensitive plants present will receive higher-level resource protection.

- UARs proposed for designation as motorized trails on the NFTS may either provide access to dispersed recreation opportunities, contribute to the diversity of motorized recreation opportunities, or provide access for administrative purposes.
- Restoring drainage patterns on UARs are limited to where the inventory and analysis identified a moderate to high resource risk that could not be reduced to an acceptable level, and/or those not proposed for NFTS.
- UARs considered for designation as a motorized trail on the NFTS will not be barricaded.
- In most cases, dead-end routes without recreational or administrative value, roads leading to, or ending in private property, and redundant (or duplicate) roads would not be designated on the NFTS.

Changes to NFTS Roads

- All unneeded roads (duplicative to others that provide access) will be closed via barricades, decommissioned and removed from the NFTS transportation atlas.
- Considerations for removal of roads from the NFTS are limited to ML 1 and 2 roads when they: are not needed for administrative purposes, or do not contribute to the diversity of recreation opportunities, and/or have resource risks that cannot be mitigated to an acceptable level of low or moderate risk.
- Where the road segments would continue to be maintained to allow for passenger cars (ML 3 downgraded to ML 2), the following is required: segments must provide loops and/or linkages within or between the existing and proposed NFTS motorized trail networks and roads.
- Considerations for stormproofing NFTS roads and motorized trails are limited to where the inventory and analysis identified a moderate to high resource risk to water quality, and the road or motorized trail is needed for public or administrative access.

Other

- Motorized trails within ROS classification semi-primitive non-motorized are considered on a case-by-case basis and only if the corresponding forest plan amendment would be non-significant.
- Consideration within IRAs is limited to the designation of motorized trails alongside borders.

Collaborative Group Recommendations

In 2010, the SRNF entered into an interagency agreement with the US Institute for Environmental Conflict Resolution Program, who contracted with the Center for Collaborative Policy to collaborate with Board of Supervisors, Administrative Officer and Roads Department representatives for Del Norte

County; Friends of Del Norte; Elk Valley Rancheria, Smith River Rancheria, Tolowa Nation, Smith River Alliance; California Wilderness Coalition; Blue Ribbon Coalition.; Cliffhangers, Del Norte County Fish & Game Advisory Committee, and recreation advocates. The purpose was to bring interested parties together to share relevant information, discuss interests relative to travel management, and to work together to develop recommendations to carry forward in a proposal that would make changes to the NFTS. The following Table 2-1 describes the recommendations from the collaborative group for UARs the Forest Service considered during the development of the action alternatives.

Table 2-1. Collaborative group recommendations for further consideration of UARs.

UAR Number	Forest Service Original Proposal	Route Details Identified by Collaborative	Collaborative Final Recommendation	Alternative		
				4	5	6
17N17.1	Add to trail system as motorized trail.	Provides access to historic mine site and hunting.	Designate for motorized access.	Restore	Restore	0.0-1.98 M Trail
17N49.100	Add short section of 17N49.100 to junction with 17N49.104 to allow access to the 104 route. Barricade and restore.	Provides access to the 104 route; delineate using boulders and other native materials.	Group agreed to add the short section of 17N49.100 to the junction with 17N49.104 (to allow access to the 104 route). Barricade and restore.	0.0-3.78 M Trail 3.78–4.0 Restore	0-1.9 Restore	0.0-3.78 M Trail 3.78–4.0 Restore
17N49.104	Add to trail system as motorized trail. Barricade sensitive habitat.	Part of a system of old mining routes on Gasquet Mountain. This UAR is partially within the IRA. The group agreed to allow access because of the loop opportunities in that area.	Designate for motorized access on 3.82 miles out of the total 4.68 miles.	0.0-4.68 M Trail	0.0-4.68 Restore	0.0-3.82 M Trail 3.82-4.68 Restore
17N49.105	Incorrectly identified as being recommended for motorized access.	Mistakenly placed in wrong table.	Remove from system to protect *Darlingtonia* bog. Alternative access available. Route should not be added.	0.0-1.4 Restore	0.0-1.4 Restore	0.0-1.4 Restore
17N49.106	Barricade and restore.	Portion within IRA.	The group agreed not to add the last short section in the IRA.	0.0-0.32 Restore	0.0-0.32 Restore	0.0-0.32 Restore
305.109 “Pine Flat”	Add to trail system as motorized trail.	Portion within IRA and includes sensitive plants. Extra emphasis management needed to designate for motorized access.	The group agreed to add to the terminus.	0.0-2.4 M Trail	0.0-2.4 Restore	0.0-2.4 M Trail
305.118	Add to trail system as motorized trail. End trail at Still Creek. Seasonal closure required. Need culvert at POC site.	POC/bog issues. Route provides search/rescue access.	Designate for motorized access, but shorten to prevent OHV access to bog before Still Creek; seasonal closure required. Need culvert at POC site.	0.0-0.8 M Trail 0.8-1.5 Restore	0.0-0.8 Restore	0.0-0.8 M Trail 0.8-1.5 Restore
305.125	Add to trail system as motorized trail. Barricade sensitive habitat.	Historic mine route. Meadows require protection.	Designate for motorized access, but barricade sensitive habitat where necessary to prevent OHV access.	0.0-1.4 M Trail	0.0-1.4 Restore	0.0-1.4 M Trail
314.1	Add to trail system as motorized trail.	Portion within IRA. Existing pond at end of route. POC concerns.	Designate for motorized access, but shorten route to prevent OHV access to pond near end of route.	0.0-1.2 M Trail	0.0-1.2 Restore	0.0-1.2 M Trail

UAR Number	Forest Service Original Proposal	Route Details Identified by Collaborative	Collaborative Final Recommendation	Alternative		
				4	5	6
405.10	Add to trail system as motorized trail. Barricade if sensitive plants are found.	Old cabin at end of route, good hunting access. Field review by environmental groups determined there were no sensitive plants present.	Designate for motorized access.	0.0-0.74 M Trail	0.0-0.5 M Trail 0.5-0.74 Restore	0.0-0.5 M Trail 0.5-0.74 Restore
405.103	Add to trail system as motorized trail. Correct drainage issues near creek.	Old mining site with interpretative potential.	Designate for motorized access, but correct drainage issues near creek. Repair existing culvert.	0.0-3.5 M Trail	0.0-3.5 M Trail	0.0-3.5 M Trail

Protecting and Restoring Natural Resources

During the development of the action alternatives, the Forest Service recognized a common approach to limit the extent of direct effects to the following natural resources was warranted, as they are considered prone to adverse effects from the compacted physical footprint of roads themselves (and UARs proposed for designation as motorized trails on the NFTS), as well as from continued motorized use:

- Water quality as the Smith River is designated a key watershed, managed per the Aquatic Conservation Strategy.
- Port-Orford-cedar at risk to root disease (*Chamaecyparis lawsoniana*; POC) caused by the non-native pathogen *Phytophthora lateralis* (PL).
- Sensitive plants growing within or near the road or UAR footprint.

During the development of the action alternatives, the following guidelines were applied to lower risks and likelihood for reaching thresholds of concern for the resources listed.

Water Quality and Aquatic Resources

- **Avoid all undesirable effects.** Consider barricading portions of UARs that are not consistent with the Aquatic Conservation Strategy (ACS) and close and decommission unneeded roads to reduce fill volumes and lower risk of road failure and sedimentation to stream channels, as well as restore drainage patterns that have been altered by routes.
- **Minimize undesirable effects from continued motorized use.** Consider surface graveling, water-bars, out-sloping and broad-based drain dips on designated roads and motorized trails.
- **Minimize undesirable effects typically associated with the physical footprint and large storm events.** Consider reducing the likelihood effects of fine sediment delivery to streams by stormproofing road and motorized trails by replacing undersized culverts and cross drains, and constructing diversion dips at road-stream crossings.

Port-Orford-cedar

- **Minimize introduction of disease into uninfected POC forested areas.** Place gates to prevent motorized access (both public and administrative), seasonally open only when soils are dry, apply surface gravelling (spot or full length of road and motorized trail segments) to avoid direct vehicle tire contact with soils.

- **Slow the spread of PL disease where already infected POC forested areas.** Barricade to prohibit motorized use altogether, road decommissioning, place gates to prevent motorized access (both public and administrative), only seasonally opened when soils are dry, apply surface gravelling (spot or full length of road and motorized trail segments) to avoid direct vehicle tire contact with soils.

Federally-listed and Sensitive Plants

- **Avoid undesirable effects to federally listed plant species.** Consider barricading UARs, restoring drainage patterns, and closing and decommissioning unneeded roads.
- **Minimize effects to below the threshold of concern for sensitive plant species** (<20 percent decline in the number of individuals for the sample populations[11] over a 5-year sampling period per Forest Plan Ch. 4, V-18). Trigger for corrective mitigations would be initiated when a 10 or 15 percent decline (depending on species) in the sample sensitive species population is determined by monitoring inventories.
- **If inspections and condition surveys indicate effects are approaching thresholds set for resources, remedial mitigations would be implemented** (refer to monitoring section in Appendix B for a full description of methodologies). If thresholds for direct effects are reached despite application of corrective mitigations, a temporary order prohibiting continued motorized use may be authorized.

Emergency Operations

The Forest Service reviewed comments from the Del Norte County's Search and Rescue Coordinator and members of the public requesting careful consideration of select UARs, being used as motorized trails during search and rescue. Emergency operations in response to threats to health and safety are authorized across the forest and not subject to the restrictions on travel described in the MVUM (36 CFR 212 Subpart B, 212.51 a (5)).

The Forest Service considered and incorporated Del Norte County's recommended roads and UARs in at least one of the action alternatives as follows: 305.1, 305.113, 305.114, 305.115, 305.121, 305.121b, 305.124, 305.126, 305.130, 315.104, 405.103, 14N15, 15N36N, 16N18.4, 16N23A.1, 17N49.4, 17N49.100, 17N49.104, 17N49.4A, 17N49.7, 18N16.100, 18N20 and 18N20.100.

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[11] Threshold of Concern: The management response threshold for direct effects to sensitive plants was set below the allowable *threshold of concern* identified in the Forest Plan (USDA Forest Service 1995), in order to provide time for application of corrective actions before it is reached. The changes in sample plant populations entails comparing changes in control populations, which are sensitive plant populations occurring on or near restored and barricaded UARs, not designated or open to motorized travel. It is assumed that the difference in the change of a population when compared to the control population is due to the effects of the project (e.g., effects of motorized travel).

Affordability and Public Safety

During the development of alternatives, the Forest Service approached affordability prioritizing public safety and restoration of drainage patterns on UARs, even though appropriations and funding for maintaining roads and motorized trails are beyond the scope of the final travel management rule. The agency proposals took into account affordability in relationship to the amount of public use and safety (Forest Service Manual (FSM) 2350 and 7700), and compliance with trail and road management objectives (TMOs; RMOs), operational maintenance levels (OMLs)[12] and state traffic regulations (California Vehicle Code (CVC); 36 CFR 212.5a).[13]

Although maintenance of the road network on the NFTS was authorized under a separate NEPA decision, the action alternatives disclosed in this FEIS respond uniquely through select limited changes based on the following guidelines:

- **Eliminate future maintenance costs.** Prohibit motorized use, whereby short-term investments will target downgrading unneeded open roads (duplicative) to ML 1 and then decommissioning, and barricading UARs to block motorized access on those segments not under consideration for designation as a motorized trail, and then restoring drainage patterns.
- **Lower future maintenance costs.** Allow for continued motorized use, whereby on-going investments will target infrastructure improvements (stormproofing) and better alignment of maintenance levels in context of level of public use with consideration for upgrading with corresponding increased frequency of maintenance.

Validating Property Rights, Easement Records, and Jurisdictions

During the last phase in the development of the alternatives, the Forest Service conducted a case-by-case review of the documented ‘acquired rights’ and other rights, so as not arbitrarily reject a popular historic OHV route proposal, simply because segments of it end or transect private property. In cases where the United States has an easement, those UARs recommended by the public as designated motorized trails were considered for inclusion in at least one action alternative, only if identified high or moderate resource risks could be effectively mitigated.

In cases where the public recommended a UAR as a designated motorized trail that transects private lands and the United States does not possess an easement or other right-of-way, the proposal was not brought forward under any action alternative.

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[12] Objective and Operational Maintenance Levels (OMLs): Roads may be currently maintained at one level and planned to be maintained at a different level at some future date. The operational maintenance level is the maintenance level currently assigned to a road considering today’s needs, road condition, budget constraints, and environmental concerns; in other words, it defines the level the road is currently maintained. The objective maintenance level is the maintenance level assigned at a future date, considering road management objectives, traffic needs, budget constraints, and environmental concerns.

[13] California Vehicle Code (CVC): The CVC regulates the use of motor vehicles in California, including motor vehicles used on the national forests. The CVC sets safety standards for motor vehicles and vehicle operators. It defines the safety equipment needed for highway legal and non-highway legal vehicles. It also defines the roads and motorized trails where non-highway legal motor vehicles maybe operated.

The federal government, unlike state and county governments, does not have the authority to pursue adjudication of prescriptive rights over routes with historic use. The Forest Service may only acquire rights-of-way through purchase, exchange, donation, or eminent domain (condemnation), in accordance with the Federal Land Policy and Management Act (FLPMA; PL 94-579, §205(a)). Without right-of-way acquisition by one of those means, the Forest Service has no right-of-way for either administrative or public access.

Alternatives Considered in Detail

Three action alternatives (Alternatives 4, 5 and 6) and a no-action alternative (Alternative 1) are analyzed in detail in this FEIS. Alternative 1, the No Action alternative, serves as a baseline for comparison among the alternatives, and is required by the implementing regulations of the National Environmental Policy Act (NEPA). All action alternatives exclude *Helkau* and *Mus-yeh-sait-neh* TCPs, which are nominated or listed on the National Register of Historic Places (NRHP), research natural areas and wild river designations. The comparison of alternatives table and a comparative display of the environmental consequences by alternative at the end of this chapter outline the range of motorized recreation and access to dispersed recreation sites analyzed in each alternative.

Descriptions of the Proposed Management Actions

For the purpose of this analysis, each road and UAR is identified by a unique number and individually listed addressed in *Appendix A. Alternative Tables*. The management actions considered within the alternatives are described as follows:

Changes to NFTS

Open For Vehicle Use

- **Designation of UARs on the NFTS.** Designation of UARs on the NFTS includes identifying vehicle class and, if appropriate, season-of-use. Designations are considered in order to respond to the need for public and administrative motorized access. Mitigations identified in Appendix A would be implemented prior to addition to NFTS:
  - Add UARs as motorized trails,
  - Add UARs as ML 2 and 3 roads (represents inadvertent errors in the transportation atlas).
- **Upgrade to ML 2 (open).** In some cases, a road is designated as ML 1 (closed to motorized use) but is currently drivable and identified as having a high recreation need. Upgrading these roads to ML 2 provides for access by high-clearance vehicles. Upgrading to ML 2 provides public access for street legal and non-street legal classes of vehicles and allows the SRNF to manage use to reduce resource risk. Upgrading may involve road surface improvements, such as installing, repairing or replacing culverts or waterbars where resource risks warrant (see Stormproof under Risk Mitigations).
- **Downgrading to ML 2 (street and non-street-legal vehicles allowed; a more restrictive use).** Downgrading an ML 3 road, which only allows for street legal, licensed vehicle use, to ML 2 would

allow for use by street legal and non-street legal classes of vehicles. Because ML 2 roads allow for both licensed and unlicensed vehicle use, they are considered mixed-use roads.

- **Convert roads to motorized trails.** Roads not required for administrative access that provide for public access are converted to motorized trails, where resource risks can be mitigated.
- **Parking sites.** All action alternatives include access to parking sites.
- **Change the ROS classification from Semi-primitive Non-motorized to Semi-primitive Motorized.** Reclassification of requires a project-specific amendment to the LRMP (see Appendix Forest Plan Amendment). The use levels and long-term general popularity of Blackhawk Bar warrant a special-case consideration of a non-significant forest plan amendment to the Recreation Opportunity Spectrum (ROS) designation, in order to provide public access to this area.

Closed to Vehicle Use

- **Designation of UARs on the NFTS as ML 1 (closed).** Some action alternatives include UARs proposed for designation on the NFTS as ML 1 for future administrative needs. The routes would be designated and put into road storage, which may include removing or repairing road drainage features (including any culverts), installing rolling dips or waterbars and barricading to prevent use.
- **Downgrading to ML 1 (closed).** Downgrading ML 2 to ML 1 would close the road for motorized use (no vehicle class allowed) but would maintain the option of future administrative use. Downgrading to ML 1 is primarily aimed at the reduction of maintenance costs on low-use roads. Downgrading and managing as ML 1 may involve removing culverts and other drainage features to leave the road in a hydrologically maintenance-free condition (road storage) and barricaded to prevent use (see below).
- **Decommission.** Decommissioned NFTS roads are left in a maintenance-free condition (i.e. remove drainage structures, re-establish natural drainage patterns). They are not drivable by motor vehicles and are not part of the NFTS. Decommissioning of roads is considered in order to respond to a variety of criteria, including responding to changes in administrative access needs, minimizing damage to forest resources; minimizing harassment to wildlife; and reducing maintenance costs. For roads that are currently non-drivable and present a low risk, removing the road from the NFTS may simply involve an amendment to the NFTS database; however, in other cases, when a road is still drivable and, or there is a moderate or high resource risk, actions associated with decommissioning listed below may be required.
- **Management actions/mitigations for decommissioning and putting UARs/road into ML1 status:**
    - **Waterbar.** Water dispersion treatments are designed to stop water from concentrating on the travelway surface, reduce the potential for stream diversions (i.e. prevent water from flowing down the road or trail), which reduces the potential for off-site sediment delivery to water resources.
    - **Remove culvert and associated fill.** This action is aimed at eliminating the need for road maintenance, re-establishing pre-road construction drainage patterns, and restoring the stream crossing road fill at stable locations, away from streams.

- **Treat weed sources.**
- **Barricade.** This includes the placement of a barrier (gate, earthen mounds or large rock) at the entrance to a road or route. The objective is to prevent motorized use and promote passive restoration of the travelway.

Restoration of Drainage Patterns on Inventoried Unauthorized Routes

The action alternatives include restoring drainage patterns that have been altered by routes. Restored routes are not part of the NFTS. The objective is to leave the route corridor in a natural slope condition that provides for natural slope surface drainage, promotes revegetation and minimizes surface flow and channel diversion, erosion, and sedimentation; and subsequent damage to soil and water resources during storm events (stormproofing). Restoration of drainage patterns is considered in order to respond to a variety of resource concerns, including reducing damage to forest resources. Depending on slope location, type of stream crossings, and surface flow and channel diversion potential of a road or route, restoring drainage patterns on UARs may require as little as a simple barricade or as much as the use of heavy equipment to correct drainage problems. The specific actions needed are based on the site-specific conditions and may include the following treatments:

- **Resource Protection.** Add waterbars/rolling dips, remove culvert and associated fill, and address other resource issues (noxious weeds) prior to barricading.
- **Barricade.** To prevent unauthorized use, all UARs not added to the system would be barricaded under all action alternatives. UARs that come off roads identified for decommissioning would not require separate barriers as the decommissioned road would require a barrier placed at the entrance of the road.

Resource Risk Mitigations/Maintaining NFTS Roads and Motorized Trails

Mitigation measures are specific actions that are proposed to avoid, reduce, or eliminate route-related impacts on forest resources. In some cases, the following is both a management action and a mitigation. Appendix A identifies by road or trail mitigations necessary to reduce risk to public safety and impacts to botanical, wildlife, or aquatic species, and water quality. Mitigations apply to NFTS current and proposed roads and motorized trails. Appropriate BMPs will be applied during implementation of mitigations to protect and maintain water quality. When resource risks are identified as high or moderate in the travel analysis process, mitigations are required to reduce the risk to comply with Forest Plan standards and guidelines (see *History of Alternative Development*). Mitigations are further detailed in *Appendix D. Mitigation Measures*. Within this appendix, mitigation measures for the following:

- **Seasonal Gate Closures.** Changes to season-of-use designations on NFTS roads and motorized trails. Season of use can include adding seasonal gates to prevent spread of POC root disease or to temporarily restrict use of a road or trail to where damage to sensitive plants, soil, or water resources may otherwise occur.

- **Stormproofing.** Stormproofing includes actions on open roads and trails that would reduce the risk of road failure in storm events. This includes adding waterbars/rolling dips and drainage improvement (culvert addition, repair or upgrade). In addition, ML 1 roads in "road storage" would be made hydrologically maintenance free by removing or repairing drainage features including activities such as water bars/rolling dips, culvert removal and gating as needed to prevent motorized use.
- **Griffin Creek Bridge Repair.** This is a phased bridge repair focused on removal and demolition. This phase includes removing the bridge railing for re-use when the deck and curbs are re-established in the second phase; removing and demolishing the concrete deck, glulam girders and steel diaphragm members; and removing and demolishing the offset pier down to the top of the pier footing at ground elevation. The bridge repair design is to be fully supported from abutment to abutment. The second phase entails excavating the base of the existing abutments to establish a new center footing to complement the two exterior footings for each abutment. The forms will be constructed for reinforced concrete columns to tie into footings, and three steel girders on abutment seats with new diaphragms between girders will be installed. The girders will be painted, the formwork for the deck constructed, the reinforced concrete deck poured and curb installed, and the bridge railing reinstalled.
- **Additional Resource Mitigations (as per Appendix A):**
    - **Route delineation** would occur by placement of a physical barrier to travel, such as large boulders or other imported material, in close proximity to the motorized trail prism, designed to keep vehicular traffic on the designated road or motorized trail and prevent unlawful use.
    - **Maintain roads and trails** as per the *Six Rivers Road Maintenance* project and associated motorized trail maintenance analysis included in Appendix D.
    - **Addition of gravel for POC mitigation.** Reinforce existing gravel on roads or add new gravel along sections of road and motorized trails near POC to reduce vehicle contact with mud and reduce the spread of PL root disease to uninfected POC populations.
    - **Sensitive plant species.** The Sensitive Plant Species Management Actions would be followed (see Appendix B) and would include route delineation through use of boulders, logs, etc. to protect sensitive plant species.
    - **Naturally occurring asbestos.** This is aimed at increasing public awareness about the potential exposure to naturally occurring asbestos (NOA) while traveling on newly designated NFTS roads and, or motorized trails, and the risk associated with exposure. Information may be made available in maps and literature available at the Gasquet Ranger District office, or through signage.

Resource-Specific Design Criteria Applicable to All Action Alternatives

Water Quality, Soils, Geology, Aquatic Resources

- All applicable best management practices (BMPs) will be implemented to reduce the risk of sediment delivery to streams. Best management practices are located in *Appendix D. Mitigation Measures*.
- Restoration, decommissioning, downgrading and upgrading work will occur when stream flow is at a minimum, typically during the dry season. Streams will be dewatered where necessary prior to any activity involving heavy equipment. Specific dewatering methods (pipe, pump, etc.) will be determined on a site-by-site basis.
- Native or straw mulch will be applied to all disturbed ground prior to seasonal rain or summer thunderstorms to minimize surface erosion.
- Decommissioned or restored stream channel side slopes and channel bottom gradients will be designed to blend with the natural channel above and below to minimize potential for unexpected channel adjustments.
- Large rocks will be placed in the restored stream channels where needed to protect newly created side slopes and reduce the potential for post-treatment channel adjustments.
- Replacement of stream crossings (upsizing) culverts will be designed to accommodate the 100-year flood event and have no diversion potential.
- Limitations on the amount of ground disturbing work in watersheds would occur to reduce the risk of multiple ground disturbing actions occurring that would lead to excess water quality concerns.

Wildlife

Northern Spotted Owl (NSO)

Road/route upgrades, decommissioning, or restoration activities has the potential to cause noise disturbance to nesting NSO from loud and sustained noise-generating activities (use of heavy equipment machinery or chainsaws). Based on consultation with the US Fish and Wildlife Service:

- Except for specific high priority roads that pose a high risk to aquatic resources scheduled for upgrades or decommissioning, noise-generating activities within 0.25 miles of unsurveyed northern spotted owl nesting and roosting habitat will not occur between February 1 and July 9, unless surveys determine the site to be unoccupied. To minimize impacts to northern spotted owl from noise-generating activities on those high priority roads:
  - No activities will occur between February 1 and July 31 within 0.25 miles of occupied NSO activity centers (AC; nest site) unless surveys determine the birds are non-nesting.
  - No limited operating period (LOP) will be applied on high priority roads outside of known NSO ACs.
- No suitable nesting or roosting habitat will be removed.
- No large snags would be felled unless they pose a hazard to public or staff safety. All hazard trees would be felled and left on site.

Marbled Murrelet (MAMU)

Road/route upgrades, decommissioning, or restoration activities has the potential to cause noise disturbance to nesting MAMU from loud and sustained noise-generating activities (use of heavy equipment machinery or chainsaws). Based on consultation with the US Fish and Wildlife Service:

- Except for high priority roads that pose a high risk to aquatic resources roads, noise-generating activities within 0.25 miles of unsurveyed MAMU nesting habitat will not occur between March 24 and August 5. In addition, work between August 5 and September 15 will not begin until 2 hours after sunrise and stop two hours before sunset unless surveys determine the site to be unoccupied.
- To minimize impacts to MAMU from noise-generating activities on high priority roads, no activities will occur between March 24 and September 15 within 0.25 miles of occupied MAMU site unless surveys determine the birds are non-nesting. No LOP will be applied on high priority roads outside of known MAMU sites.
- No suitable nesting habitat will be removed.

Monitoring

Monitoring is critical for evaluating the effectiveness of management decisions and the validity of the analysis assumptions and conclusions where uncertainty exists. Monitoring of road and motorized trail conditions is required each year. Road and motorized trail condition surveys must meet national standards. All action alternatives provide for monitoring to ensure compliance with Forest Plan standards and guidelines. Project specific monitoring is identified for soil and water resources, botanical resources, noxious weeds, and POC in *Appendix B. Monitoring Plan*.

Immediate corrective actions would be implemented if road or motorized trail condition surveys determine motor-vehicle use on a national forest is directly causing adverse effects to public safety, botanical, soil, vegetation, wildlife, wildlife habitat, or cultural resources due to motorized use on the road or motorized trail, in accordance with 36 CFR 212.52(2). These actions may include, but are not limited to, reduction in the amount of OHV use, signing, or barriers to redistribute use, closure to causative vehicle type(s), or total closure, and structural solutions, such as culverts. Temporary forest closures may be applied to prohibit all motorized use, as authorized by the forest supervisor, if corrective mitigations are ineffective to address resource or public safety issues.

In addition to effectiveness monitoring related to the actions of this project, many other forms of monitoring and data collection take place on the forest. These include ongoing monitoring that is already prescribed for forest plan and water waiver permit compliance, such as surveys of roads and trails for infrastructure condition, monitoring of cultural resource sites, noxious weed spread, rare plants, soil erosion or wildlife surveys. Some of this monitoring may directly or indirectly assess the effects of roads or trails on resources, as well as generally assessing conditions of roads for stability and maintenance. All relevant information will be used to assess the effectiveness of the actions proposed to allow for corrective management adjustments.

Alternatives Described in Detail

Alternative 1

Alternative 1, the No Action alternative, provides a baseline for comparing the other alternatives. Under the No Action alternative, no changes would be made to the NFTS. Current management plans would continue to guide project area management. UARs would continue to not be designated on the NFTS as roads or motorized trails, nor would they would they be barricaded or drainage patterns restored. The existing NFTS would be displayed on the MVUM and provide direction on motorized use on NFTS roads and motorized trails on the Smith River NRA. The No Action alternative is described as follows:

- **Changes to NFTS:** No additional miles of motorized recreation is considered under this alternative.
    - **Designation to the NFTS:** No roads or motorized trails would be designated.
    - **Upgrading ML 1:** No roads would be upgraded.
    - **Downgrading ML 2 and 3 roads:** No roads would be downgraded.
    - **Converting roads to motorized trails:** No roads would be converted to motorized trails.
    - **Changing season-of-use:** No changes to the season-of-use designations would occur.
    - **Decommissioning:** No roads would be decommissioned.
    - **Parking sites:** No parking sites would be identified.
- **Restoring drainage patterns:** No restoration of drainage patterns on UARs would occur.
    - **Barricades:** No barricades would be placed on closed roads or UARs.
- **Resource risk mitigations/maintain NFTS**
    - **Seasonal gate closure:** No seasonal gates would be added.
    - **Stormproofing:** No stormproofing would occur on ML 1 and 2 roads and motorized trails.
    - **Bridge repair:** No repairs would be made.
- **Change in Recreation Opportunity Spectrum (ROS):** No change in the ROS would occur.

Table 2-2 displays a summary of the actions proposed in this alternative. A complete listing of existing roads and inventoried UARs is located in *Appendix A. Alternative Tables*, under Alternative 1.

Table 2-2. Alternative 1 – summary of actions.

Action		Existing Status	Proposed Status	Miles
Changes to NFTS	Designate on NFTS	UAR	Motorized Trail	0
			ML 1 (closed)	0
			ML 2 (open)	0
			ML 3 (open)	0
	Upgrade	ML 1 (closed)	ML 2 (open)	0
	Downgrade	ML 2 (open)	ML 1 (closed)	0
		ML 3 (open)	ML 2 (open/mixed use)	0
	Decommission	ML 1 (closed)	Non-system (closed)	0
		ML 2 (open)	Non-system (closed)	0
	Convert to Motorized Trail	ML 1 (closed)	Motorized Trail	0
		ML 2 (open)	Motorized Trail	0
	Designate Parking	UAR	Parking Site	0 sites
Restoration of Drainage Patterns		UAR	Barricaded, hydrologically stable, not designated for motorized use.	0
			No barrier, Non-system[14]	156
Risk Mitigations	New Seasonal Gate Closures	NFTS Roads and Motorized Trails		0
	Stormproofing	NFTS Roads (ML 1 and 2) and Motorized Trails		0
	Bridge Repair	Structurally impaired	Structurally impaired	N/A
Change Recreation Opportunity Spectrum (ROS)		Semi-primitive non-motorized	Semi-primitive motorized	N/A

Alternative 4

Alternative 4 responds to issues concerning impacts on motorized recreation and dispersed recreation opportunities by increasing opportunities for motorized recreation and access to dispersed sites. Specifically, this alternative would: designate more motorized trails and ML 2 roads than the other alternatives; designate more motorized trails accessing dispersed recreation sites than the other alternatives; maintain more ML 2 roads than the other action alternatives; and designate the greatest number parking sites along 17N49 than the other alternatives.

Alternative 4 would designate three UAR segments currently in the semi-primitive non-motorized ROS class near Blackhawk Bar, which would require a non-significant Forest Plan amendment. These routes include 15N36N.1 (0.1 mi) and 15N36N.1B (0.2 mi) proposed as ML 2 roads, and 15N36N.1C (0.03 mi) proposed as motorized trail. Alternative 4 would require six acres of semi-primitive non-motorized to be converted to semi-primitive motorized. Alternative 4 is described as follows:

- **Changes to NFTS – Open**
    - **Designate UARs on NFTS as open**
        - 58 miles of UARs as motorized trails.

[14] Exclude routes authorized under a separate authority, such as a special use permit.

        - 12.6 miles of ML 2 and 3 (open) roads.
    - **Downgrade to ML 2:** 15 miles of ML 3 roads to ML 2 to allow mixed use.
    - **Upgrade to ML 2:** 11 miles of ML 1 (closed) roads to ML 2 (open/mixed-use) roads.
    - **Convert road to trail:** 8 miles of ML 1 and 2 roads.
    - **Parking Sites:** 5 parking areas along 17N49.
- **Changes to NFTS – Closed**
    - **Designate UARs on NFTS as closed:** 4 miles of ML 1 (closed) roads.
    - **Downgrade to ML 1:** 16 miles of ML 2 (open) roads to ML 1 (closed) roads.
    - **Decommission:** 54 miles of ML 1 and 2 roads.
- **Restore Drainage Patterns and Barricade:** 71 miles on UARs not added to the NFTS.
- **Resource Risk Mitigations/Maintain NFTS**
    - **Stormproofing:** 112 miles of ML 1 and 2 roads and motorized trails.
    - **Seasonal gate closure:** 17 additional seasonal gates on roads and motorized trails.
    - **Repair Griffin Creek Bridge:** Structurally sound bridge.
- **Change in ROS (Forest Plan Amendment):** Would convert 6 acres of semi-primitive non-motorized to semi-primitive motorized to allow for the addition of UARs 15N36N.1 (0.1 mi) and 15N36N.1B (0.2 mi) proposed as ML 2 roads, and 15N36N.1C (0.03 mi) proposed as motorized trail to provide motorized access to multiple dispersed recreation sites near Blackhawk Bar.

Table 2-3 displays a summary of the actions proposed in this alternative. A complete listing of roads, motorized trails, and UARs considered by alternative is located in *Appendix A. Alternative Tables*.

Table 2-3. Alternative 4 – summary of actions.

Action		Existing Status	Proposed Status	Miles
Changes to NFTS	Designate on NFTS	UAR	Motorized Trail	58.18
			ML 1 (closed)	4.18
			ML 2 (open)	12.23
			ML 3 (open)	0.42
	Upgrade	ML 1 (closed)	ML 2 (open)	11.05
	Downgrade	ML 2 (open)	ML 1 (closed)	16.37
		ML 3 (open)	ML 2 (open/mixed use)	15.28
	Decommission	ML 1 (closed)	Non-system (closed)	39.41
		ML 2 (open)	Non-system (closed)	14.21
	Convert to Motorized Trail	ML 1 (closed)	Motorized Trail	7.61
		ML 2 (open)	Motorized Trail	0.53
	Designate Parking	UAR	Parking Site	5 sites

Action		Existing Status	Proposed Status	Miles
Restoration of Drainage Patterns		UAR	Barricaded, hydrologically stable, not designated for motorized use.	71.22
			No barrier, non-system[15]	0
Risk Mitigations	New Seasonal Gate Closures	NFTS Roads and Motorized Trails		17 gates
	Stormproofing	NFTS Roads (ML 1 and 2) and Motorized Trails		111.67
	Bridge Repair	Structurally impaired	Structurally sound	1 bridge
Change Recreation Opportunity Spectrum (ROS)		Semi-primitive non-motorized	Semi-primitive motorized	6 acres

Alternative 5

Alternative 5 responds to issues concerning impacts to forest resources and IRAs. This alternative was developed to reduce the number and miles of roads and motorized trails open for motorized travel with specific attention given to protecting non-motorized recreation access and providing greatest level of protection for POC and other botanical resources of any of the alternatives. Specifically, this alternative would not designate motorized trails in IRAs; would not designate inventoried UARs on the NFTS that are identified as having a high risk and low need; would not retain roads on the NFTS that are identified as having a high resource risk and low need; would reduce motorized access to stands of POC; would reduce motorized access to areas with threatened and sensitive botanical species; would barricade all inventoried UARs not proposed for designation on the NFTS; and would restore drainage patterns on inventoried UARs.

Alternative 5 would designate 310 feet (0.1 mi) of UAR 15N36N.1 as an ML 2 road currently in the semi-primitive non-motorized ROS class. This action would require a non-significant Forest Plan amendment to change one acre of semi-primitive non-motorized ROS class to semi-primitive motorized ROS class. Alternative 5 is described as follows:

- **Changes to NFTS – Open**
  - **Designate UARs on NFTS as open**
    - 7.4 miles of UARs as motorized trails.
    - 2.6 miles of ML 2 and 3 (open) roads.
  - **Downgrade to ML 2:** 15.28 miles of ML 3 roads to ML 2 to allow mixed use.
  - **Upgrade to ML 2:** 4.2 miles of ML 1 (closed) roads to ML 2 (open/mixed-use) roads.
  - **Convert road to trail:** 0 miles of ML 1 and 2 roads.
  - **Parking Sites:** 1 parking area along 17N49.
- **Changes to NFTS – Closed**
  - **Designate UARs on NFTS as closed:** 6.8 miles of ML 1 (closed) roads.

[15] Exclude routes authorized under a separate authority, such as a special use permit.

- **Downgrade to ML 1:** 54.33 miles of ML 2 (open) roads to ML 1 (closed) roads.
- **Decommission:** 110 miles of ML 1 and 2 roads.

- **Restore Drainage Patterns and Barricade:** 133.2 miles on UARs not added to the NFTS.
- **Resource Risk Mitigations/Maintain NFTS**
  - **Stormproofing:** 58.6 miles of ML 1 and 2 roads and motorized trails.
  - **Seasonal gate closure:** 4 additional seasonal gates on roads and motorized trails.
  - **Repair Griffin Creek Bridge:** Structurally sound bridge.
- **Change in ROS (Forest Plan Amendment):** Convert 1 acre of semi-primitive non-motorized to semi-primitive motorized to allow for the addition of UAR 15N36N.1 (0.1 mi) as an ML 2 road to provide motorized access near Blackhawk Bar, a popular dispersed recreation site.

Table 2-4 displays a summary of the actions proposed in this alternative. A complete listing of roads, motorized trails, and UARs considered by alternative is located in *Appendix A. Alternative Tables*.

Table 2-4. Alternative 5 – summary of actions.

Action		Existing Status	Proposed Status	Miles
Changes to NFTS	Designate on NFTS	UAR	Motorized Trail	7.39
			ML 1 (closed)	6.82
			ML 2 (open)	2.21
			ML 3 (open)	0.42
	Upgrade	ML 1 (closed)	ML 2 (open)	4.21
	Downgrade	ML 2 (open)	ML 1 (closed)	54.33
		ML 3 (open)	ML 2 (open/mixed use)	15.28
	Decommission	ML 1 (closed)	Non-system (closed)	48.9
		ML 2 (open)	Non-system (closed)	61.5
	Convert to Motorized Trail	ML 1 (closed)	Motorized Trail	0
		ML 2 (open)	Motorized Trail	0
	Designate Parking	UAR	Parking Site	1 site
Restoration of Drainage Patterns		UAR	Barricaded, hydrologically stable, not designated for motorized use.	133.20
			No barrier, Non-system[16]	0
Risk Mitigations	New Seasonal Gate Closures	NFTS Roads and Motorized Trails		4 gates
	Stormproofing	NFTS Roads (ML 1 and 2) and Motorized Trails		58.63
	Bridge Repair	Structurally impaired	Structurally sound	1 bridge
Change Recreation Opportunity Spectrum (ROS)		Semi-primitive non-motorized	Semi-primitive motorized	1 acre

[16] Exclude routes authorized under a separate authority, such as a special use permit.

Alternative 6

Alternative 6 is similar to the modified proposed action, Alternative 3, which was eliminated from detailed analysis; however, it would make limited changes to address key issues identified through public comment related to motorized recreation access and restoration of surface drainage on UARs and unneeded and high-risk roads. Alternative 6 would designate inventoried UARs to the NFTS; would restore drainage patterns on inventoried UARs not designated on the NFTS; would barricade inventoried UARs not designated on the NFTS; and would designate parking along Road 17N49.

Alternative 6 would designate three UAR segments currently in the semi-primitive non-motorized ROS class near Blackhawk Bar, which would require a non-significant Forest Plan amendment. These routes include 15N36N.1 (0.1 mi) and 15N36N.1B (0.2 mi) proposed as ML 2 roads, and 15N36N.1C (0.03 mi) proposed as motorized trail. Alternative 6 would require six acres of semi-primitive non-motorized to be converted to semi-primitive motorized. Alternative 6 is described as follows.

- **Changes to NFTS – Open**
    - **Designate UARs on NFTS as open**
        - 46.37 miles of UARs as motorized trails.
        - 5 miles of ML 2 and 3 (open) roads.
    - **Downgrade to ML 2:** 15.28 miles of ML 3 roads to ML 2 to allow mixed use.
    - **Upgrade to ML 2:** 4.2 miles of ML 1 (closed) roads to ML 2 (open/mixed-use) roads.
    - **Convert road to trail:** 0.57 miles of ML 1 and 2 roads.
    - **Parking Sites:** 4 parking areas along 17N49.
- **Changes to NFTS – Closed**
    - **Designate UARs on NFTS as closed:** 11.82 miles of ML 1 (closed) roads.
    - **Downgrade to ML 1:** 20.41 miles of ML 2 (open) roads to ML 1 (closed) roads.
    - **Decommission:** 52.47 miles of ML 1 and 2 roads.
- **Restore Drainage Patterns and Barricade:** 93.47 miles on UARs not added to the NFTS.
- **Resource Risk Mitigations/Maintain NFTS**
    - **Stormproofing:** 106 miles of ML 1 and 2 roads and motorized trails.
    - **Seasonal gate closure:** 18 additional seasonal gates on roads and motorized trails.
    - **Repair Griffin Creek Bridge:** Structurally sound bridge.
- **Change in ROS (Forest Plan Amendment):** Convert 6 acres of semi-primitive non-motorized to semi-primitive motorized to allow for the addition of the following UARs: 15N36N.1 (0.1 mi) and 15N36N.1B (0.2 mi) proposed as ML 2 roads, and 15N36N.1C (0.03 mi) proposed as motorized trail to provide motorized access to multiple dispersed recreation sites near Blackhawk Bar.

Table 2-5 displays a summary of the actions proposed in this alternative. A complete listing of roads, motorized trails, and UARs considered by alternative is located in *Appendix A. Alternative Tables*.

Table 2-5. Alternative 6 – summary of actions.

Action		Existing Status	Proposed Status	Miles
Changes to NFTS	Designate on NFTS	UAR	Motorized Trail	46.27
			ML 1 (closed)	11.82
			ML 2 (open)	4.58
			ML 3 (open)	0.42
	Upgrade	ML 1 (closed)	ML 2 (open)	4.21
	Downgrade	ML 2 (open)	ML 1 (closed)	20.41
		ML 3 (open)	ML 2 (open/mixed use)	15.28
	Decommission	ML 1 (closed)	Non-system (closed)	38.25
		ML 2 (open)	Non-system (closed)	14.22
	Convert to Motorized Trail	ML 1 (closed)	Motorized Trail	0.56
		ML 2 (open)	Motorized Trail	0
	Designate Parking	UAR	Parking Site	4 sites
Restoration of Drainage Patterns		UAR	Barricaded, hydrologically stable, not designated for motorized use.	93.47
			No barrier, Non-system[17]	0
Risk Mitigations	New Seasonal Gate Closures	NFTS Roads and Motorized Trails		18 gates
	Stormproofing	NFTS Roads (ML 1 and 2) and Motorized Trails		106.0
	Bridge Repair	Structurally impaired	Structurally sound	1 bridge
Change Recreation Opportunity Spectrum (ROS)		Semi-primitive non-motorized	Semi-primitive motorized	6 acres

Alternatives Considered but Eliminated from Detailed Study

Federal agencies are required to rigorously explore and objectively evaluate all reasonable alternatives and to briefly discuss the reasons for eliminating any alternatives that were not developed in detail (40 CFR 1502.14). Public comments received in response to the Proposed Action and alternatives presented in the DEIS provided suggestions for alternative methods for achieving the purpose and need. Some of these alternatives may be outside the scope of the project, not in support of the purpose and need of the project, or duplicative of the alternatives considered in detail. Therefore, two alternatives were considered, but eliminated from detailed consideration for reasons summarized below. A detailed review and response to alternatives recommended during the comment period is located in *Appendix G. Response to Comments*, under the *Alternatives* subheading. Consideration of those alternatives recommended during the scoping period is located in the project record and available upon request.

[17] Exclude routes authorized under a separate authority, such as a special use permit.

Alternative 2

Alternative 2 is the original proposed action, which reflected the collaborative group recommendation, described in the NOI published on April 20, 2012. Prior to releasing the DEIS, this alternative was eliminated from detailed study due to public comments and concerns from regional tribes regarding travel management decisions within the *Helkau* and *Mus-yeh-sait-neh* TCPs, which are nominated or listed on the National Register of Historic Places (NRHP).

In consultation with the California State Historic Preservation Officer, the forest supervisor determined that due to these concerns any travel management decisions regarding routes within these two TCPs should be deferred until a more in-depth tribal consultation process is conducted. The Forest Service therefore modified the scope of the project to exclude the TCPs, resulting in the elimination of Alternative 2 from detailed analysis as it exceeded the new scope of the project. Alternative 3, the modified proposed action, was created to carry forward the actions identified in Alternative 2 outside TCPs.

Alternative 3

Alternative 3 most closely resembles the collaborative group recommended proposed action. Some commenters requested that additional routes not be considered for designation on the NFTS than what was scoped in the proposed action, which would be consistent with Alternative 3. This alternative was eliminated from detailed analysis in the production of the FEIS because it no longer provides for a comparison to aid decision making. Alternative 3 is not unique, as Alternative 6 incorporates the actions in Alternative 3 in respect to providing access to dispersed recreation and restoration.

Public Comments relating to Alternatives Eliminated

Comments: Close All Roads except those Needed for Administrative Purposes

Some commenters requested that all roads be closed except those required for administrative purposes. This alternative would act to eliminate access to much of the remote recreation and cultural-use destinations and wilderness trailheads in the Smith River NRA. The Smith River NRA Act (PL 101-612 (5(b)(2))) mandates the Forest Service to “provide and maintain adequate public access, including vehicular roads for general recreational activities such as camping, hiking, hunting, and fishing”, which is identified as one need for action. This alternative was eliminated from detailed analysis as it would not provide and maintain adequate public access, and is therefore not in alignment with the administrative duties of the SRNF outlined in the Smith River NRA Act or the project.

Comments: Leave only Main Roads Open, Close Wild Roads in Fragile Areas

A commenter suggested that only main roads should remain open and wild roads in fragile areas should be closed. The Forest Service considered this alternative by defining main roads as those being managed for passenger cars, ML 3 through 5 roads. Wild roads were defined as ML 2 roads and UARs. Fragile areas were deemed associated with IRAs, sensitive plant habitats, Port-Orford-cedar forests, streams and riparian reserves.

This alternative would act to prohibit motorized use on select UARs and ML 2 roads, or segment thereof. Most of the UARs are favored by the public and administrative access needs on the SRNF are primarily serviced by ML 2 roads. Many ML 3 through 5 roads cross streams and associated riparian reserves. The Smith River NRA Act mandates the Forest Service to offer exceptional opportunities for a wide range of recreational activities, including wilderness, water sports, fishing, hunting, camping, and sightseeing. As this alternative would make major changes to the NFTS that would highly limit motorized uses, this alternative was eliminated from detailed study.

Comments: Ban on Motorized Use and Off-Road Vehicles

Some commenters requested that the project ban motorized use. This alternative does not meet the purpose and need of the project, nor does it meet the administrative responsibilities of the Forest Service identified in the Smith River NRA Act (PL 101-612 (5(b)(2))). Therefore, this alternative was eliminated from detailed study.

Comments: Keep All National NFTS Roads

Many commenters did not want any existing roads to be closed or decommissioned, and suggested that if the Forest could not maintain the roads then the local users would maintain them. Engaging volunteers in the implementation of the decision is one part of the implementation strategy that will be key to successfully implementing. However, this alternative would not address the need for restoring natural drainage conditions and reduce sedimentation from UARs and unneeded NFTS roads that are currently affecting riparian and streamside areas.

The Forest Plan includes direction for managing and protecting aquatic and riparian ecosystems in the Smith River, as it is designated as a key watershed. As part of this designation, the aquatic conservation strategy (ACS) and specific standards and guidelines apply when managing roads and vehicle access to protect fisheries and other aquatic biota, water quality, and riparian vegetation (pp. IV-106 to IV-111)[18]. Since not all roads were identified as being needed by the public or the Forest Service and some roads had resource risks that could not be mitigated to a level compliant with Forest Plan standards, this alternative was considered but eliminated.

Comments: Allow Motorized Travel within 300 Feet of Road

During the county coordination process and scoping period, requests were made to allow for motorized travel within 300 feet of the designated NFTS roads and motorized trails for uses such as camping, wood gathering and hunting. For this reason, comments indicated the proposed action did not adequately address providing access to dispersed recreation sites within a relatively short distance (approximately 300 feet) of NFTS roads.

As disclosed during the scoping period, the 1990 *Smith River National Recreation Area Act* established the Smith River NRA, restricting off-road vehicle use to designated roads and trails on the

[18] Forest Plan page numbers cited reference the electronic version of the Forest Plan.

NFTS. In addition, information indicating effective January 8, 2009, “road designations must specify either that they include parking within one vehicle length, or within a specified distance of up to 30 feet, from the edge of the road surface” (Forest Service Manual 7700-Chapter 7710, §7716.1).

Upon request of Del Norte County Board of Supervisors (BOS), the SRNF’s forest supervisor submitted a request to the regional forester on October 17, 2013, to consider and respond to allowing motorized use within 300 feet of designated roads and trails. The regional forester did not provide affirmative direction to allow motorized travel within 300 feet of designated roads and trails. As allowing motorized travel within a 300-foot corridor of NFTS roads is not consistent with policy or FSM direction, this alternative was eliminated from detailed analysis.

Comments: Route Designation to Some Dispersed Recreation Sites

The Del Norte County BOS proposed an extensive list of sites to have routes on the NFTS designated to access them. In general, all routes to potential camping sites were proposed for designation in Alternatives 4 and 6, if they required a designated route for legal motorized access, and any identified resource concerns could be mitigated to meet Forest Plan standards and guidelines. There were a limited number of situations where the proposed campsite did not have a route that could be considered in detail for inclusion in an alternative.

Specifically, if a dispersed campsite could be accessed by a route that was less than a car-length long, then no designated route was needed to access that site. If there did not appear to be any route and/or camping opportunity in the general vicinity of an investigated point, then nothing could be mapped or considered for designation. Other issues that precluded proposing a route for detailed consideration were that some routes were popular illegal dumping grounds, or if the resource and/or safety concerns on a route could not be mitigated to standard, then it was not considered in detail in an alternative. One notable example was a site where a new bridge would need to be built to provide access. This would be beyond the scope of the project since it would require new construction. Therefore, an alternative considered select route designation was not considered in detail.

Comments: Motorized use in the High Plateau and Diamond Creek Drainages

Some commenters requested that the SRNF allow motorized use in the High Plateau and Diamond Creek drainages, which were closed to motorized use in 2001 under a previous decision. The commenters suggested that conditions may have changed that would warrant consideration of designating motorized trails and, or roads in this area. The forest pursued a formal reconsideration of the environmental analysis and decision to determine if conditions had changed. Based on the review of the environmental assessment and field review by forest staff, the forest supervisor concluded that the decision to close 18N13 and 18N09 to motorized vehicle travel is still needed to protect the area from the spread of POC root disease. A copy of the Supplemental Information Report is located in the project record and available upon request. This alternative was therefore eliminated from detailed study.

Comments: More Mixed-Use Roads

The Blue Ribbon Coalition also requested that all ML 3 roads be evaluated for mixed-use designations. At the time the DEIS was released, state, county, and Smith River NRA ML 3, 4, and 5 roads were not being considered in this analysis. Since the publication of the DEIS, the Del Norte County BOS passed the Del Norte County Rural Recreational Roads Ordinance on October 28, 2014, which provided for OHVs, further defined in the ordinance as motorized wheeled vehicles that are not licensed for on-highway use as well as highway licensed vehicles while operating off-highway, to travel on specified county roads. The BOS then requested that the forest supervisor consider providing mixed-use travel on specified ML 3 roads. As the Forest Service considered the safety risks associated with mixed-use, particularly on paved roads, as unacceptable, this alternative was eliminated from detailed study.

However, select ML 3 road segments were considered for downgrading to ML 2 under Alternatives 4 and 6 to accommodate mixed use, where the road surface type, use levels and road geometry were deemed compatible.

Comments: Designate Play Areas for Mud, Rock Crawling, or Hill Climbing

One commenter was concerned that there are no play areas for mudding, rock crawling or hill climbing that would allow the Class II user to play included in any of the alternatives. The Smith River NRA Act limits motorized travel on the district to designated routes and does not allow for off-road play areas for mudding or rock crawling. For this reason, providing for these play areas is outside the scope of the proposal. Therefore, this alternative was eliminated from detailed study.

Comments: Designate Routes under the Authority of RS2477

In the summer of 2013, the Del Norte County BOS adopted a resolution (Resolution 2013-022) that recognized various rights of way, across public lands, to identify historic mine locations in Del Norte County. At the time no status or maintenance level was proposed by the county as the adoption of the resolution was simply a recognition of the right-of-way as allowed for by the US Congress under Revised Statute 2477 (RS 2477). The RS 2477 mines were identified as existing between 1866, when RS 2477 was enacted by the US Congress, and 1976, when it was effectively repealed under the FLPMA. In passage of Resolution 2013-022, the BOS recognized that the locations of these mines are of a “historic” nature and value to the county and that access should be kept open.

The Forest Service does not have the authority to make binding determinations on the validity of RS 2477 right-of-way claims. The following, therefore, is an informal, non-binding, administrative determination for Forest Service land use planning and management purposes. In accordance with Forest Service policy at FSM 2734.51, to constitute acceptance, RS 2477 highways must meet three conditions: 1) the lands involved must have been public lands, not reserved for public uses, at the time of acceptance; 2) some form of construction of the highway must have occurred; and 3) the highway so constructed must be considered a public highway.

Lands administered by the Forest Service were reserved for public uses as of the date of their reservation, and this area of what is now the SRNF was first established by Presidential proclamation in

July 1908. If a route to any mine was in existence prior to the establishment of the national forest, it would have been for the specific purpose of allowing the mining claimant(s) access to the claim. This does not appear to meet the criteria of being a public highway as the road's primary purpose. Therefore, the Forest Service did not identify these routes as needing to be designated to the NTFS per RS 2477. Therefore, this alternative was eliminated from detailed analysis.

Comments: The Sourdough Camp Trail and McGrew Trail

A number of commenters were concerned about the management of the McGrew and Sourdough Camp Trails. The Sourdough Camp and McGrew trails are accessed via Del Norte County road 305. County roads are not managed by the forest. Although the trails, along with roads 402, 206, and 450, extend onto the SRNF, they are managed in their entirety by the Rogue River-Siskiyou National Forest, including the issuance of special use permitted events. Management of Del Norte County and Rogue River-Siskiyou roads and motorized trails are outside the scope of this project. Therefore, this alternative was eliminated from detailed study. However, the Gasquet District Ranger is in communication with the Rogue River-Siskiyou to aid in addressing concerns over the management of the southern terminus of the trails.

Comments: Prohibit Logging in the Smith River Area

The purpose and need of this project is to reduce risk to resources and make limited changes to the NFTS to provide for dispersed and motorized recreation opportunities and administrative access. Vegetation management activities identified in this project are limited to reducing resource risk associated with the NFTS, such as control of noxious weeds. Any analysis and decision regarding the prohibition of logging, or any related aspect of timber harvest management, is beyond the scope of the project; therefore, this alternative was eliminated from detailed study.

Comments: Management of Pappas Flat

Commenters suggested many ways to improve the management of this site. Pappas Flat is within the *Mus-yeh-sait-neh* TCP. The road related to Pappas Flat was removed from the project area prior to the release of the DEIS in response to a significant issue identified through scoping, which modified the scope of the project to exclude TCPs. Therefore, this alternative including the Pappas Flat area was eliminated from detailed study.

Comments: Forest Road 16N71 to Bear Basin

One commenter suggested that the road to the Bear Basin Lookout and Pierson Cabin, Forest Road 16N71, should be upgraded from ML 2 (high-clearance vehicles) to ML 3 (suitable for passenger cars). They stated, "This half-mile of road is heavily used by visitors accessing the facility from the beginning of June to the end of October. The facility typically is booked solid during these months. It is also used during the rest of the year, although less so because road access is usually limited by snow. The road is easily passable by passenger cars and has been for several years."

The SRNF can provide maintenance as needed on this road without reclassifying it as Operational Maintenance Level (OML) 3. The comments received indicate many users of this cabin are aware that the road is suitable for their passenger vehicles, and that the site does not appear to be under-utilized; on the contrary, it is popular and fully occupied—possibly with some not able to make reservations at the cabin because of how quickly the availability fills up. Upgrading this road to ML 3 does not offer anything unique to the purpose and need of the project. Therefore, this alternative was eliminated from detailed analysis.

Comments: High Dome and Elk Ridge Camp Trails

Removing existing motorized use on the High Dome and Elk Ridge Camp Trails was of concern for a number of commenters. High Dome and Elk Ridge Camp trails are *existing* motorized trails. The scope of the actions considered in the project do not include existing motorized trails, and therefore were not considered for removing motorized use (see the *Scope of Project* section within *Chapter 1. Purpose and Need and Proposed Action*, for more information on the scope of the project). Therefore, there are no proposed actions for these trails in any of the action alternatives. The maps in the DEIS incorrectly illustrated High Dome Trail as a non-motorized trail, and are corrected in the FEIS maps.

Comments: Private Property Concerns and Special Use Permitting

These concerns were route and road specific (Forest Roads 16N19, 17N23, 17N26, 18N26, 17N22W,15N01, 15N01A, 15N38, 15N63, 16N18, 16N18K, 17N04, 16N33, and UARs 411.102 and 17N22W.1) and related to access to private parcels. Each of these concerns was followed up with individually, addressing their specific concerns. Access across NFS lands to private property beyond what is afforded through the administration of the NFTS is handled through special use permitting (SUP), which is a separate authorization process than what is considered in the scope of this analysis. Where appropriate, the alternatives were amended to not impede uses authorized under SUP authority.

Comparison of Alternatives

While Table 2-6 provides a brief summary of the alternative actions, Table 2-7 is a comparative display of environmental consequences by alternative that are displayed in detail in their respective sections of Chapter 3.

Table 2-6. Comparison of alternatives.

Action		Existing Status	Proposed Status	Miles			
				Alt 1	Alt 4	Alt 5	Alt 6
Changes to NFTS	Designate on NFTS	UAR	Motorized Trail	0	58.18	7.39	46.37
			ML 1 (closed)	0	4.18	6.82	11.82
			ML 2 (Mixed Use)	0	12.23	2.21	4.58
			ML 3 (open)	0	0.42	0.42	0.42
	Upgrade	ML 1 (closed)	ML 2 (open)	0	11.05	4.21	4.21
	Downgrade	ML 2 (open)	ML 1 (closed)	0	16.37	54.33	20.41
		ML 3 (open)	ML 2 (Mixed Use)	0	15.28	15.28	15.28
	Decommission	ML 1 (closed)	Non-system (closed)	0	39.41	48.9	38.25
		ML 2 (open)	Non-system (closed)	0	14.21	61.45	14.22
	Convert to Motorized Trail	ML 1 (closed)	Motorized Trail	0	7.61	0	0.57
		ML 2 (open)	Motorized Trail	0	0.53	0	0
	Designate Parking	UAR	Parking Site(s)	0	5	1	4
Restoration of Drainage Patterns		UAR	Hydrologically Stable, not designated for motorized travel & barricaded	0	71.22	133.20	93.47
			Non-system / no barrier (excluding UARs with Special Use Permit (SUP)	156.45	0	0	0
Resource Risk Mitigations	Stormproof	NFTS Roads (ML 1 and 2) and Motorized Trails		0	111.67	58.63	106.0
	Number of New Gate Locations	NFTS Roads and Motorized Trails	Gated NFTS	0	Seasonal = 17 Year round = 5	Seasonal = 4 Year round = 4	Seasonal = 18 Year round = 4
	Griffin Creek Bridge Repair	Structurally unsound	Structurally sound bridge	1	1	1	1
Change in Recreation Opportunity Spectrum (ROS)		Semi-primitive non-motorized	Semi-primitive motorized	0 acres	6 acres	1 acre	6 acres

Summary of Environmental Consequences

Table 2-7. Comparison of effects for each alternative by significant issue.

Source	Indicator(s)	Alt 1	Alt 4	Alt 5	Alt 6
Issue: Closing Roads and trails impacts motorized recreation opportunities					
Recreation	Total miles of motorized trails open to passenger vehicles (designated miles of motorized trails).	-	66.3	7.4	44.7
	Total miles of motorized trails open to non-highway-legal 4WDs, motorcycles, ATVs.	12.4	78.7	19.8	57.1
	Total number of dispersed sites accessible by motorized vehicles.	0	56	11	54
	Miles of UARs barricaded and restored.	0	71.2	133.2	92.8
	Miles of UARs with no barrier (excluding routes used for SUP access).	154.8	0	0	0
	Miles of motorized trail accessed from each parking area designated along Road 17N49.	0.03	27.84	2.37	20.82
	Close by downgraded roads to ML 1 – change in number of miles of roads/motorized trails (w/public access) proposed within half mile of wilderness or neighboring lands.	-	0.39	14.50	0.66
	Close by decommissioned ML 2 roads – change in number of miles of roads/motorized trails (w/public access) proposed within half mile of wilderness or neighboring lands.	-	0.95	12.69	0.95
	Acres outside ½ mile of an area where non-motorized use is allowed (dry season).	65,215	72,767	94,463	78,144
	Acres outside ½ mile of an area where non-motorized use is allowed (wet season).	88,904	95,641	113,984	95,684
	Non-motorized quiet recreation opportunity (1 = most effects to 4 = least effects).	1	2	4	3
	Impact of proposed changes to the NFTS on neighboring private and federal lands (1 = most effects to 4 = least effects).	3	1	4	2
	Motorized recreation opportunity (1 = most effects to 4 = least effects).	2	4	1	3
	Type of motorized access to dispersed recreation (1 = most effects to 4 = least effects).	1	4	2	4
	Road or motorized trail designations (actual lengths miles).	0	16.92	1.74	7.56
	Upgraded roads from ML 1 to ML 2 (actual lengths miles).	0	6.05	1.44	1.44
	Upgraded Roads from ML 1 to ML 3 (actual lengths miles).	0	0	0	0
Recreation, Wilderness and Wild and Scenic Rivers	Downgraded roads from ML 3 to ML 2 within a ½ mile of wilderness or neighboring lands.	0	3.89	3.89	3.89
	Downgraded roads to ML 1 within a ½ mile of wilderness or neighboring lands.	0	0.39	14.50	0.66
	Decommissioned ML 2 roads within a ½ mile of wilderness or neighboring lands.	0	0.95	12.69	0.95
	Net change within a ½ mile of wilderness or neighboring lands (increasing access minus decreasing access).	0	+25.52	-20.12	+11.28
	Miles newly designated roads within designated river corridor.	0	0	0	0

	Miles newly designated motorized trails within designated river corridor.	0	0	0	0
	Miles unbarricaded UARs within designated river corridor.	2.46	0	0	0
	Miles of total newly designated travelways or unbarricaded UARs within designated river corridor.	2.46	0	0	0
Issue: Designating motorized trails in inventoried roadless areas impacts nonmotorized recreation opportunity and inventoried roadless area character.					
Inventoried Roadless Areas	Number of sensitive plants on or within 30 feet of motorized trails or UARs.	6,106	3,887	0	2,689
	Number of times high-risk to POC roads/routes directly access POC stands or indirectly within 300m upstream of POC.	53	29	1	23
	Miles of ML 1 roads, decommissioned roads, restored & barricaded UARs.	9.82	22.74	35.78	30.9
	Miles of motorized trails, ML 2-5 roads, and UARs with weed sites.	2.47	2.47	2.46	2.47
	Number of times high-risk to POC roads/routes directly access POC stands or indirectly within 300m upstream of POC.	53	29	1	23
	Number of sensitive plants within 30' and within 100' of routes.	6106	3887	0	2689
	Number of times high-risk to POC roads/routes directly access POC stands or indirectly within 300m upstream of POC.	53	29	1	23
	Acres of suitable habitat for TES botanical species within 30' of motorized trails.	138.3	95.8	16.2	40.3
	Acres of suitable habitat for TES botanical species within 30' of motorized trails.	138.3	95.8	16.2	40.3
	Miles of ML 2-5 roads, motorized trails, unbarricaded UARs, restored UARs by VQO – Modification.	11.84	19.58	1.11	1.48
	Miles of ML 2-5 roads, motorized trails, unbarricaded UARs, restored UARs by VQO – Partial Retention.	1.53	1.8	1.1	1.47
	Miles of ML 2-5 roads, motorized trails, unbarricaded UARs, restored UARs by VQO – Retention.	2.2	2.85	1.73	2.05
	Miles of ML 2-5 roads, motorized trails, unbarricaded UARs, restored UARs by VQO – Preservation.	0	0	0	0
	Acres of IRA beyond ½ mile of motorized trail or road open to motorized use.	32,342	40,938	47,827	42,383
	Miles of motorized trails and ML 2 roads.	18.3	26.3	15.1	20
Issue: Public motorized use of roads and trails will impact forest resources.					
Water Quality, Aquatic Biota	Miles of UARs designated on the NFTS measured by water quality risk rating (low, moderate, high = L, M, H).	0	75 total (55 L, 14 M, 6 H)	17 total (10 L, 3 M, 4 H)	61 total (44 L, 11 M, 6 H)
	Equivalent roaded acres (no watersheds come close to the threshold of concern—well below the threshold of concern for all alternatives).		Little to no difference between alternatives in changing the ERAs as the magnitude of observed effects is small as tare the geographic extent of the impacts.		
	Miles of NFTS road decommissioned measured by water quality risk rating (low, moderate, high = L, M, H).	0	54 total (38 L, 6 M, 10 H)	110 total (51 L, 28 M, 31 H)	54 total (37 L, 7 M, 10 H)
	Miles of road and motorized trail stormproofed measured by water quality risk rating (low, moderate, high = L, M, H).	0	111 (64 M, 47 H)	58 miles (36 M, 22 H)	106 miles (60 M, 46 H)

	Miles of active unauthorized road restoration by water quality risk rating (low, moderate high = L, M, H).	0	66 total (14 L, 37 M, 15 H)	133 total (96 Low, 23 Mod, 14 High)	93 total (58 L, 19 M, 16 H)
	Miles of NFTS road to be downgraded or stored as level 1, in a maintenance free condition, measured by water quality risk rating (low, moderate, high = L, M, H).	0	31 total (17 L, 6 M, 8 H)	69 total (31 L, 27 M, 11 H)	36 total (11 L,12 M, 13 H)
	Total indicator score – reducing risk of adverse impacts to water quality.	(1)	(2)	(4)	(3)
	Indicator score for aquatic biota.	(1)	(2)	(4)	(3)
Wildlife	Miles/number of routes of UAR added in late successional habitat.	0	0.42 mi (3 routes)	0	0.16 mi (3 routes)
	Miles of UAR added in within 0.25 miles of known threatened, proposed, or Forest Service Sensitive species nest or Sensitive sites.	2.41 (existing)	0	0	0
	Miles/number of routes of UARs added in late-successional reserves/marbled murrelet Critical Habitat.	0	2.1 (6)	0.24 (2)	1.93 (8)
	Miles/number of routes of UAR added in northern spotted owl Critical Habitat.	0	2.31 (6)	1.74 (1)	1.92 (5)
	Miles/number of routes system roads and UAR decommissioned/restored in late-successional reserves and marbled murrelet Critical Habitat.	0	50.48 (98)	60.13 (112)	60.13 (112)
	Miles/number of system roads and UAR decommissioned/restored in northern spotted owl Critical Habitat.	0	45.3 (91)	52.1 (97)	52.1 (97)
	Miles/number of system roads and UAR decommissioned/restored in northern spotted owl territories.	0	83.4 (146)	105.58 (174)	80.39 (157)
	Total percent restored/decommissioned.	0	21%	47%	40%
Fire and Fuels	High fire need roads on the NFTS by alternative.	194.6 miles – no additions or upgrades	188.65 miles	113.51 miles	186.53 miles
	Alternative ranking.	4	3	2	1
POC	Number of times high-risk UARs directly accessed uninfected POC stand or indirectly accessed uninfected POC stand within 300 meters of stream crossings.	83	33	7	27
	Acres of uninfected POC at increased risk by mitigation – least risk to greatest risk.	3,546	1,068	17	1,042
Botanical resources	Number of plants of federally listed endangered and sensitive species affected by designating UARs as motorized trails.	0	1,387	0	1,153
	Number of occurrences of federally listed endangered and sensitive species affected by designating UARs as motorized trails.	0	38	0	30
	Number of plants of federally listed endangered and sensitive species affected by designating parking sites along 17N49.	0	5	0	0
	Number of occurrences of federally listed Endangered and Sensitive species affected by designating parking sites along 17N49.	0	1	0	0
	Acres of road decommissioned in federally listed endangered and sensitive species serpentine habitat.	0	50	144	50

	Acres of federally listed endangered and sensitive species serpentine habitat proposed for restoration of hydrologic function.	0	332	774	486
	Number of plants of federally listed endangered and sensitive species affected by barricading UARs not designated on the NFTS.	0	10,447	21,515	12,256
	Number of occurrences of federally listed endangered and sensitive species affected by barricading UARs not designated on the NFTS.	0	18	38	26
Geology	Designation as NFTS routes – slope stability.	0 miles (4)	29.4 (1)	3.9 (3)	21.7 (2)
	Designation as NFTS routes – asbestos hazard.	0 miles (4)	58.5 (1)	8.8 (3)	44.4 (2)
	Designation as NFTS routes – combined hazard.	0 miles (4)	58.9 (1)	11.4 (3)	49.7 (2)
	Upgrading and downgrading of roads (ML 1 and 2) – slope stability.	0 miles (1)	N/A	N/A	N/A
	Upgrading and downgrading of roads (ML 1 and 2) – asbestos hazard.	0 miles (1)	-0.6 (2)	-14.1 (4)	-2.0 (3)
	Upgrading and downgrading of roads (ML 1 and 2) – combined hazard.	0 miles (1)	-0.6 (2)	-14.1 (4)	-2.0 (3)
	Road decommissioning – slope stability.	0 miles (1)	-12.4 (2)	-26.3 (4)	-12.4 (2)
	Road decommissioning – asbestos hazard.	0 miles (1)	-8.7 (2)	-32.1 (4)	-8.7 (2)
	Road decommissioning – combined hazard.	0 miles (1)	-18.6 (2)	-48.0 (4)	-18.6 (2)
	Restoration of drainage patterns on UARs – slope stability.	0 miles (1)	-20.0 (2)	-47.1 (4)	-29.4 (3)
	Restoration of drainage patterns on UARs – asbestos hazard.	0 miles (1)	-35.0 (2)	-89.0 (4)	-53.5 (3)
	Restoration of drainage patterns on UARs – combined hazard.	0 miles (1)	-42.4 (2)	-99.5 (4)	-61.2 (3)
	Geology cumulative ranking by all hazards.	1.75 (2)	1.73 (1)	3.73 (4)	2.45 (3)
	Geology cumulative ranking by combined hazards only.	1.75 (1)	1.75 (1)	3.75 (4)	2.50 (3)
Soils	Miles of UARs designated as motorized trails or NFTS roads by EHR (high, moderate, low).	High EHR – 0	High EHR – 57	High EHR – 7	High EHR – 43
	Miles of NFTS roads to be decommissioned by EHR (high, moderate, low).	Mod and Low – 0	Mod and Low – 13	Mod and Low – 9	Mod and Low – 18
	Miles of UARs restored drainage pattern by EHR (high, moderate, low).	(1)	(4)	(2)	(3)
	Soils effects: Acres of net soil productivity improved.	High EHR – 0	High EHR – 17	High EHR – 36	High EHR – 10
	Indicator score.	Mod and Low – 0	Mod and Low – 33	Mod and Low – 68	Mod and Low – 39
	Reducing the risks of adverse impacts to soil productivity.	(1)	(3)	(4)	(2)
Noxious weeds	Miles of UAR added as open roads to the NFTS.	0	12.65	2.63	4.74
	Miles of UAR added as motorized trails to the NFTS.	0	58.18	7.39	44.18
	Miles of NFTS road upgraded from OML 1 (closed) to OML 2 (open).	0	11.05	4.22	4.21
	Miles of NFTS road downgraded from OML 2 or 3 (open) to OML 1 (closed).	0	16.37	54.33	21.31
	Miles of NFTS road closed through decommissioning.	0	53.62	110.35	53.63
	Miles of UARs and roads proposed for barricading.	0	65.95	133.40	92.84

Issue: Changing the existing NFTS within traditional cultural properties nominated or listed on the National Register of Historic Places may impact sacred sites and cultural values of regional tribes.					
Traditional Cultural Properties	Traditional Cultural Properties area affected measured by acres.	Traditional Cultural Properties were excluded from all alternatives.			
Affordability Measurement Indicators	Existing NFTS roads (miles).	486.59	486.59	486.59	486.59
	Existing NFTS trails (miles).	12.4	12.4	12.4	12.4
	Net changes to NFTS roads (miles).	0	-44.45	-110.2	-36.7
	Net changes to NFTS trails (miles).	0	66.32	7.39	44.74
	Annual and Proposed Maintenance Costs of System	**$703,956**	**$704,316**	**$601,785**	**$688,943**
	Implementation Costs of Design Features	**$0**	**$4,380,678**	**$7,276,894**	**$5,361,956**
	Monitoring Costs	**$0**	**$11,105**	**$11,105**	**$11,105**
	Total Estimated Cost by Alternative	***$703,956***	***$5,096,099***	***$7,889,784***	***$6,062,004***

Chapter 3. Affected Environment and Environmental Consequences

Introduction

This chapter summarizes the physical, biological, social, and economic environments that are affected by the proposed action and alternatives, and the effects on that environment that would result from implementation of each of the alternatives. This chapter also presents the scientific and analytical basis for comparison of the alternatives presented in Chapter 2.

The *Affected Environment* section under each resource topic describes the existing, or baseline condition, against which environmental effects were evaluated and from which progress toward the desired condition can be measured. Environmental consequences form the scientific and analytical basis for comparison of alternatives, including the proposed action, through compliance with standards set forth in the Six Rivers National Forest's Land and Resource Management Plan (Forest Plan), as amended. The environmental consequences discussion centers on direct, indirect, and cumulative effects, along with applicable mitigation measures. Effects can be neutral, beneficial, or adverse. The *Irreversible and Irretrievable Commitments of Resources* section is located at the end of this chapter. These terms are defined as follows:

- Direct effects are caused by the action and occur at the same place and time as the action.
- Indirect effects are caused by the action and are later in time, or further removed in distance, but are still reasonably foreseeable.
- Cumulative effects are those that result from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions.

Changes between Draft and Final

General

- The order of Chapter 3 was changed to alphabetical. Minor formatting, grammatical and clerical errors were corrected throughout Chapter 3.
- Alternative 3 was dropped from the project (see Chapter 2) and analysis for all resources.
- Forest Plan page references were edited to match the electronic version of the Forest Plan (as displayed on the digital pages).
- Analysis of all resources were updated to reflect the changes to the Alternatives as described in the beginning of Chapter 2 (Changes between Draft and Final) including analysis of the 18N07 Griffin Creek Bridge repair.
- Changed language to reflect *designation* as opposed to *addition* of UARs to the NFTS. This change was also propagated throughout the document in text and tables.

- The list of federally listed species noted in the draft EIS was reviewed by using the Arcata U.S. Fish and Wildlife Office on-line IPaC (Information for Planning and Conservation) search page (USDI 2016). The current list did not add or remove any additional ESA listed species.
- The Six Rivers National Forest Species Reference Document (USDA Forest Service, Six Rivers National Forest 2016) was incorporated by reference for species life history information, including information on wildlife, botany or aquatic species listed or Sensitive species that will not be affected by this project.

Alternative Specific

- Changes between the draft and final EIS for Alternative 4 include adding seasonal and year round gates, changing two barricades to year-round gates, removing seasonal gates that were determined to be in low risk areas or were already closed by another gate elsewhere, downgrading two roads from ML3 to ML 2, decommissioning additional ML1 roads, and designating two UARs as motorized trails.
- In Alternative 4, removed analysis of "unbarricaded UARs that were not designated." The agreement made in the collaborative meetings was that all UARS that were not designated to the NFTS would have drainage patterns restored and would be barricaded. Exceptions to this included access to UAR is no longer available (i.e. off a road that was decommissioned) or access to private land and search and rescue request from the collaborative, in which case the UAR would have a gate placed after the drainage patterns were restored.
- Changes between the draft and final EIS for Alternative 5 include adding seasonal and year round gates, changing two barricades to year-round gates, removing seasonal gates that were determined to be in low risk areas or were already closed by another gate elsewhere, downgrading two roads from ML3 to ML 2, decommissioning additional ML1 roads, decommissioning or downgrading to ML 1 two additional ML 2 roads, and restoring 6 additional UARs.

Resource Specific

Only those resources that had additional changes to those mentioned above are displayed below.

- **Air Quality:** To decrease duplication, natural occurring asbestos (NOA) was moved to *Geology* (for where NOA is found) and *Engineering* (for public safety mitigations)
- **Aquatic Biota:** The following changes were made from the DEIS:
  - Added additional Forest Service aquatic sensitive species
  - Updated consultation with National Marine Fisheries Service (NMFS) to reflect a new Watershed Fisheries Restoration Program Biological Assessment (2015) and corresponding NMFS Biological Opinion (2015) with additional NMFS Coordination and notification on recovery actions.
  - With the release of the SONCC coho recovery plan (2014), information was added on how action meets SONCC recovery actions.
  - Updated effects section to reflect water quality and Port-Orford-cedar (POC) analysis.

  - Moved background information into the *Aquatic Biological Evaluation and Specialist Report* to streamline section.
  - Added analysis of the projects consistency with the Aquatic Conservation Strategy (ACS) objectives.

- **Botany:** Minor changes were made in wording throughout the document for the sake of clarity to achieve better understanding.
  - In the section *Analysis Framework: Statute, Regulation, Forest Plan, and Other Direction,* issues and concerns regarding the Broken Rib Botanical Area were added to the FEIS.
  - In the section *Effects Analysis Methodology*, the Sensitive Plant Species Management Actions were added. This management action was created in response to comments received concerning motorized impacts to rare plants in the project area and the determination that the project may affect individuals but not lead to a trend toward federal listing or loss of viability. The objective is to monitor motorized use over time in order to detect a threshold of decline that could foreshadow a loss of viability or trend toward federal listing for either the opposite-leaved lewisia, the serpentine Indian pink, the western bog violet or Howell's jewelflower, which grow within 30 of user created routes (UARs). The effects determination has been changed in order to make the strategy the key to mitigating effects to the rare Sensitive species analyzed.
  - In the section *Assumptions specific to botanical resources analysis*, the Sensitive Plant Species Management Actions was added.
  - In the section *Data Sources*, the second edition of *The Jepson Manual Vascular Plants of California* was noted as the source of plant nomenclature used throughout the Botany discussion.
  - In the section *Botanical Resource Indicators*, the long-term timeframe was increased from 20 to 25 years in order to take into account any potential delays in implementation.
  - In the section *Botanical Resources Methodology by Action*, the indicator *Seasonal gate closure of roads and motorized trails* was dropped because the Sensitive plant species analyzed are typically dormant during the seasonal closure period. The indicator *Direct effects (within 30 feet) and indirect effects (within 30 to 100 feet) of barricading UARs* was added because barricading overtime can protect Sensitive plant species analyzed from detrimental increases in motorized use. These changes are reflected throughout the analysis of the alternatives. The change in indicators resulted in a change in ranking of Alternatives 1 and 4 with Alternative 1 moving up and Alternative 4 moving down in the ranking. The ranking of Alternatives 5 and 6, alternative that had the least impact on the Sensitive species analyzed, remained unchanged.

- The present and future actions in the cumulative effects analysis, which trailed the section *Alternative 1 – No Action*, was moved to the end of the *Botanical Resources Methodology by Action*, where it now resides with the discussion of past actions in order to create continuity. The references to the cumulative effects analysis at the end of each alternative were deleted to avoid redundancy.
- The *Affected Environment* section also included a discussion of *Watch List* species. The DEIS erroneously stated that the Waldo wild buckwheat was moved to a watch list; however, the forest does not have standards and guidelines for designating Watch List species in their Land and Resource Management Plan, and therefore, the Waldo wild buckwheat is not designated as such. As noted in the DEIS, the Waldo wild buckwheat (*Eriogonum pendulum*) was removed from the Sensitive plant list in 2012, due to its abundance, which removes the concern that management activities could lead to a loss of viability or trend toward federal listing. Therefore, this species was removed from analysis.
- Several literature citations from peer reviewed journals were added to the species accounts for Howells jewelflower and the serpentine Indian pink in order to address comments that referred to the description of the disturbance resistance nature of these species presented in the draft EIS as anecdotal supposition.
- Tables were added at the end of each alternative in order to summarize data for each indicator.
- A table titled *Roads Proposed for Decommissioning* under each alternative was deleted as this information occurs elsewhere in the EIS.

- **Fire and Fuels:** No changes were identified.
- **Geology**: Below is a tabulation of the changes between DEIS and FEIS versions of the geology chapter of the travel management NEPA analysis document.
    - Edited NOA section to reduce redundancy – all design features to reduce health effects from breathing in NOA were moved to *Public Safety* in the *Transportation* section.
    - Described reduction in risk associated with barricading UARs.
- **Heritage Resources**: Heritage resource management specialist changes to the DEIS as applied to the FEIS:
    - Additional fieldwork was completed by an archaeologist from January 2015 to May 2015 to survey and assess potential impacts to cultural sites resulting from changes to the proposed actions for the FEIS. The additional analysis is documented in confidential CRIR #2015051000047; no additional standard resource protection measures are recommended.
    - The 2013 Regional Programmatic Agreement (PA) for the Pacific Southwest Region (R5) regarding the processes for compliance with §106 of the National Historic Preservation Act is added as an additional reference and source used in the Analysis Framework.

    - Total number of sites on the district was updated to include sites that have been recorded since the publication of the DEIS.

- **Inventoried Roadless Area:** The Analysis Framework section further expands on the evolution of law, regulation and policy governing the management of inventoried roadless areas. The assumptions pertaining to the effects analysis are provided. The Affected Environment section was expanded to include information on the IRAs in the project area in respect to the features and values that characterize IRAs, and changed conditions due to the Gasquet Fire Complex. In response to the high level of public interest and concern about effects to IRA characteristics from the project, the methodology was further developed to provide a quantitative assessment of indicators influencing specific IRA values and characteristics identified in public comment. The analysis integrates the indicators and effects of other resources considered in the analysis to provide an interdisciplinary analysis of the effects to IRAs.
- **Noxious Weeds**
    - The *Analysis Framework* section was expanded to include policy references pertinent to managing noxious weeds and preventing their introduction and spread onto Forest Service lands. This included the addition of the document *Best Management Practices: Invasive Plant Species and Aquatics Organisms, Six Rivers National Forest*, which was developed and implemented in 2014.
    - The table in the *Affected Environment* section was moved to the *Environmental Consequences* section where it is an integral part of the Risk Assessment, which was added to the FEIS. The table was uncluttered to remove the five right-hand columns, which contained information provided elsewhere in the document. The Risk Assessment is required for all ground-disturbing actions. The Risk Assessment resulted in a high risk of introduction and spread yielding mitigations designed to reduce the risk to low. These mitigations were added to the *Noxious Weed Control Mitigations Common to All Action Alternative* section.
    - The long-term timeframe under the *Noxious Weed Methodology by Action* section was increased from 20 to 25 years in order to take into account any potential delays in implementation.
    - The noxious weed indicators were changed to indicators that have a more direct bearing on the introduction and spread of noxious weeds, the more pertinent issue being whether roads and trails are open to introduction and spread of noxious weeds. This resulted in changes throughout the analysis of effects and changed the rankings of the alternatives such that Alternatives 1 was increased in ranking, now receiving a higher ranking than Alternative 4 and Alternative 5 is now ranked higher than Alternative 6. Note that dropping Alternative 3 resulted in the alternatives being ranked from 1 to 4 instead of 1 to 5.

- The cumulative effects analysis, which trailed the *Mitigations Common to All Action Alternative*s section, was moved to the more appropriate *Environmental Consequences* section. The two sentences at the end of each alternative that referred back to the cumulative effects analysis were deleted to avoid redundancy.
- *Compliance with the Forest Plan and Other Regulatory Direction* was added and follows the *Summary of Effects Analysis across All Alternatives* section. It reiterates that compliance with Forest Service policy requires that mitigations described in the analysis, designed to lower the risk of introduction and spread of noxious weeds, are implemented.

- **Port-Orford Cedar (POC)**
  - For all alternatives, direct/indirect effects, the long-term indicators were changed from 20 years to greater than 5 years. This was primarily because POC within newly infested stream course often die within a 5-year period.
  - Total infected acres changed from 3,000 to 3,300, based on 2012 imagery.
  - The *Life History* heading for Port-Orford-cedar was added, along with a *Phytophthora lateralis* section that better describes the history, biology and spread mechanism of the pathogen.
  - The *POC Road and Trail Closure* heading was added. Closures were a large component of public feedback, and it was necessary to give context of proposed POC closures in relation to existing conditions and a brief background of POC closures.
  - Updated assumptions specific to POC:
    - #2. Footnote referring to catchment area, added for clarity, "by separating the acres infected…" at the end of sentence.
    - #3a. Analysis distance for POC stands was changed from 100 feet downstream of road crossing to 300 meters down stream of road crossing. Deleted footnote referring to changing from 100' to 300 meters since this was incorporated into document.
    - #5. Added "Tree size, proximity to streams and tree density also affect the probability of infection (Jules et al. 2014).
    - #6. Acknowledges that gates are not 100 percent effective at stopping motor vehicle traffic.
    - #7. Discussion that all POC road mitigations are not equal.
  - *Risk Analysis Methodology* section: Original GIS model assumed 100 feet or less downstream from road/route crossing was high risk. Current analysis used 300-meter maximum based on field validation and phone discussion with professor Eric Jules, of Humboldt State University.

- Updated acreages of POC within watershed with better analysis after receiving comments about some routes. This led to more thorough review of existing POC layer and spatial accuracy of data.
- *Spatial Data* table. Added 2014 Google™ Earth color imagery to data. Dropped Alternative 3 data layer and added updated data layers for the other alternatives.
- Modified Indicator #2 of potential acres put at risk to include management action by alternative. This was done to show the risks to POC by the management action are not equal in potential risk to POC. In the DEIS POC report, it could be inferred that there was an equal risk to POC in watersheds despite management action, and this needed clarity to show that different management actions present different risk to POC. Included diagram to show a spectrum of risk associated with management action.
- The figure that showed the Smith River NRA and watershed boundaries was changed. Port-Orford-cedar polygons were included and the cartographic lines within the map were changed for clarity.
- *Methodology by Action* section: Added a third action, *Direct/indirect effects to restoration activities for routes not brought forward*. Not including this in the DEIS failed to show that restoration changed the risk of the routes being restored, which was not captured in the final analysis when trying to compare each alternative to each other.
- Short-term effects. Changed *not applicable…* to *less than 5 years*.
- Under *Environmental Consequences* section, cumulative effects common to all alternatives was added. This was done instead of repeating it for each alternative.
- The *Summary of Effects* section was expanded, with a discussion that followed to better describe how each alternative compares to the others and how each alternative achieves (or not) the Purpose and Need of the project. The summary table was changed to include management action.

- **Recreation**
  - The *Analysis Framework* section now includes Forest Plan direction for recreation, transportation, and facilities management within designated Wild and Scenic Rivers.
  - The list of assumptions has several additional assumptions listed, that were realized as we recalculated our analysis and responded to comments.
  - The *Affected Environment* section – *Historic Recreation Use* now includes mention of historically used dispersed recreation routes that were provided by respondents to the scoping process, and the steepness of Smith River NRA terrain as a natural prohibitive barrier to unmanaged off-road travel by motor vehicles.

- In the *Affected Environment* section– *Current Recreation Use*, the table and associated text now include data from the 2013 National Visitor Use Monitoring (NVUM) survey. The list of data sources in the *Effects Analysis Methodology* section also includes this addition.
- The *Affected Environment* section – *Current Recreation Use* was revised after careful review of the 2008 NVUM survey. Percentages and visitors' home counties were corrected, and the 90 percent confidence intervals for the total number of visitors was added to clarify that the total number of visitors is an estimate, and the likely range in which the true number of total visitors fell.
- References to mixed-use designations on ML 3 roads were removed.
- The tables under what is now labelled *Measurement Indicator 1A* were recalculated with the additional assumption that unbarricaded UARs under Alternative 1 may routinely impact the quiet recreation experience, because although we assume that most people intend to follow the law; we recognize that where the NFTS is poorly defined and UARs lack barricades to deter travel, there could be higher levels of inadvertent illegal travel on these unbarricaded UARs by well-intentioned travelers, so this potential use of UARs should reduce the acres available for quiet recreation under the No Action alternative. Therefore, by barricading UARs not designated to the system, all the action alternatives show more acres available for quiet recreation by eliminating the potential for noise impacts from UARs.
- In the *Effects Analysis Methodology* section, under *Recreation Indicator Measures,* Measurement Indicator 1B was added to evaluate the effects of the alternatives on quiet recreation within certain designations of Wild and Scenic Rivers that are managed for quiet recreation opportunities. Corresponding analysis was added to the E*nvironmental Consequence*s section under the various alternatives.
- Measurement Indicator 2 added data on roads being downgraded to ML 1 roads, and a clarification on why we analyzed roads being downgraded to ML 2 roads. The former reduces potential conflicts with users on neighboring private or state lands or neighboring wilderness, and the latter may increase potential conflicts. This measurement indicator omitted ML 2 roads being converted to motorized trails, because this change is not likely to have a sizeable effect on the type or amount of traffic on the route.
- The formula for calculating Measurement Indicator 3(Roads: Change in road miles by vehicle class) changed to reflect that no ML 3 roads will have mixed-use designations, and that we considered the effects of downgrading an ML 3 road to ML 2.
- Under Measurement Indicator 3C, the table showing trails accessed from parking areas was edited to correct previous typographical errors, and to reflect corrections to the GIS data and changes in the actions. Any accessible motorized trails near the alternatives' trailheads are now included, even if they do not directly connect to a trailhead—

specifically, 17N49.13, and/or 17N49.104A, where applicable. The miles of trails in this area under Alternative 5 were reduced slightly because 17N49.102 is no longer included in Alternative 5.

- Since trail difficulty ratings are no longer standard in the *Forest Service Trails Management Handbook* (FSH 2309.18), we removed the table analyzing trail difficulty under Management Indicator 3. The *Management Indicator 3 Methods* section now includes an explanation of this change, its rationale, and the inclusion of trail class estimations in the recreation analysis in the project record.
- A table was added to Measurement Indicator 4 to show existing NFTS roads that access dispersed recreation sites, and any proposed changes to access on those roads under the action alternatives.
- In the *Assumptions* section, we included that an action alternative provides a diversity of designated motorized recreation opportunities that are clearly defined parts of the NFTS (e.g., signing designated roads and motorized trails, while barricading closed and decommissioned roads, and UARs not added to the NFTS), and this would reduce the likelihood of illegal cross-country motorized travel.
- In the *Assumptions* section specific to the recreation analysis, we added the assumption that quiet recreation activities can occur near or away from motorized routes, with or without a non-motorized trail, anywhere on the Smith River NRA.
- In the *Assumptions* section, we define *trail class*, communicate that it was estimated in the project record, and disclose that trail class data for proposed trails were not specifically analyzed because they are only estimates at this time.
- The *Environmental Consequences* section now analyzes certain likely indirect effects of the restoration of drainage patterns on UARs, the Del Norte Reclassification of Unpaved County Roads as Compatible for Mixed Use Travel decision, and effects to quiet recreation within certain designations of Wild and Scenic Rivers.
- The analysis of each action alternative was updated to include the revised mileages, and the removal of the mixed-use proposal, and the additional action of downgrading some road segments from ML 3 to ML 2, with the clarification that such downgrading would allow new OHV use on those road miles.
- The *Environmental Consequences* section previously said that Alternatives 4 and 6 had the *greatest positive effect* for motorized recreation opportunities in the DEIS. This was corrected to show that Alternative 4 had the greatest positive effect to motorized recreation opportunities.
- In the *Environmental Consequences* section in the DEIS, Alternative 5 had a negative effect on dispersed recreation, and in the FEIS it has a small positive effect on dispersed recreation, compared with the No Action alternative.

  - The *Compliance with the Forest Plan and Other Regulatory Direction* section now includes a description of ROS conformance to the recreational river classification under the Wild and Scenic Rivers Act, near Blackhawk Bar.

- **Wildlife**
  - Clarified that no noise-generating activities will occur within 0.25 miles of a known northern spotted owl (NSO) nest site between February 1 and July 31 unless surveys to protocol show the owls are non-nesting.
  - Clarified that no activities will occur within 0.25 miles of an occupied marbled murrelet (MAMU) site between March 24 and September 15.
  - Clarified that the potential for adverse effects is from noise-generating activities within 0.25 miles of unsurveyed nesting/denning habitat for NSO and MAMU.
  - Changed the *may affect, not likely to adversely affect* determination for marbled murrelet Critical Habitat to *no effect*, based on additional review by the USFWS.
  - Cited additional literature provided by the public during the comment period regarding effects of road use on wildlife species:
    - Temple and Gutierrez (2004), Factors related to fecal corticosterone levels in California Spotted Owl: Implications for assessing chronic stress.
    - Grub et al (2012), Response of nesting northern goshawks to logging truck noise Kaibab National Forest, Arizona.
  - Added additional language on the Forest Service’s policy for the conservation of migratory birds.
  - Numerous corrections were made, including corrected titles and species category. Critical Habitat and Late-Successional Reserves are specific, designated land allocations (not habitat quality definitions) and both need to be capitalized. Forest Service Sensitive species are a specific, designated group of species; therefore, also capitalized. The FEIS was corrected in several places to say, *FS Sensitive species nest site* instead of *sensitive species proposed nest site* as worded in the DEIS. There are no endangered wildlife species on the forest, so the word was deleted from the sections. In addition, one of the management indicator species (MIS) assemblage titles was added to the table.
  - Updated species *category* for fisher and wolverine based on new information from the USFWS.
  - Corrected road density by 5th-field watershed for Alternative 1 that had been incorrectly calculated in the DEIS.
  - Corrected mileage, road density, and percentages by alternative to reflect changes between the draft and final EIS.

- Updated baseline acres of suitable habitat on the district based on 2015 Gasquet Complex wildfires.
- Numerous edits for sentence clarity (did not change the meaning of the information).
- Corrected the Neotropical migratory birds list to include six other species known or thought to occur on the Smith River NRA.
- Updated sighting information on the Western bumblebee.
- Changes between the DEIS and FEIS for Alternative 6 include adding seasonal and year-round gates, changing barricades to year-round gates, replacing the 18N07 Griffin Creek Bridge, removing seasonal gates that were determined to be in low risk areas or were already closed by another gate elsewhere, downgrading two roads from ML 3 to ML 2, decommissioning additional ML 1 roads, changing two roads from restoring/decommissioning to ML 1, and designating two UARs as motorized trails.
- Corrected the acreage of the wildlife action area to include NSO territories that extended beyond the district boundary.

Analysis Process

The environmental consequences presented in this chapter address the impacts of the actions proposed under each alternative. The effects findings in this chapter are based on site-specific analyses of each road, and inventoried unauthorized route (UAR) proposed for addition to the National Forest Transportation System (NFTS), changes in vehicle class or maintenance level, decommissioning of roads, and/or restoration of drainage patterns on UARs. Readers seeking information concerning actions associated with a specific road, trail, or area are directed to Appendix A, where mitigation measures are documented.

For ease of documentation and understanding, the effects of the alternatives are described for the proposed management actions (Chapter 2) to provide the total direct and indirect effects of each alternative (see below). The combination of these actions is then added to the past, present and reasonably foreseeable actions in the cumulative effects analysis. The short and long-term impacts of the proposed actions are addressed in sum total in this chapter. For most resources, one or more resource indicators are used to measure the direct and indirect effects of each alternative.

Actions/Mitigation Measures/Design Features

In the following analysis, management actions such as installation of a seasonal gate can be both an action and a mitigation measure or design feature. Appendix D includes a list of all mitigations and design features that apply to this project.

Cumulative Effects

According to the Council on Environmental Quality (CEQ) National Environmental Policy Act (NEPA) regulations, *cumulative impact* is the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (federal or non-federal) or person undertakes such actions (40 CFR 1508.7).

The cumulative effects analysis area is described under each resource including private and other public lands that lie within the forest boundary. Past activities are considered part of the existing condition and are discussed in the *Affected Environment (Existing Conditions)* and *Environmental Consequences* sections under each resource.

In order to understand the contribution of past actions to the cumulative effects of the alternatives, this analysis relies on current environmental conditions as a proxy for the impacts of past actions. This is because existing conditions reflect the aggregate impact of all prior human actions and natural events that have affected the environment and might contribute to cumulative effects.

This cumulative effects analysis does not attempt to quantify the effects of past human actions by adding up all prior actions on an action-by-action basis. There are several reasons for not taking this approach. First, a catalog and analysis of all past actions would be impractical to compile and unduly costly to obtain. Current conditions have been impacted by innumerable actions over the last century (and beyond), and trying to isolate the individual actions that continue to have residual impacts would be nearly impossible. Second, providing the details of past actions on an individual basis would not be useful to predict the cumulative effects of the proposed action or alternatives. In fact, focusing on individual actions would be less accurate than looking at existing conditions, because there is limited information on the environmental impacts of individual past actions, and one cannot reasonably identify every action over the last century that has contributed to current conditions. Additionally, focusing on the impacts of past human actions risks ignoring the important residual effects of past natural events, which may contribute to cumulative effects just as much as human actions. By looking at current conditions, we are sure to capture all the residual effects of past human actions and natural events, regardless the particular action or event contributed those effects. Third, public scoping for this project did not identify any public interest or need for detailed information on individual past actions. Finally, the CEQ issued an interpretive memorandum on June 24, 2005, regarding analysis of past actions, which states, “agencies can conduct an adequate cumulative effects analysis by focusing on the current aggregate effects of past actions without delving into the historical details of individual past actions.” For these reasons, the analysis of past actions in this section is based on current environmental conditions.

Appendix C lists present and reasonably foreseeable future actions potentially contributing to cumulative effects, a summary of the projects is located in the project record and available upon request.

Assumptions and Limitations Common to All

The following assumptions and limitations were applied in the effects analysis for each resource:

NEPA

- For travel management, the federal action triggering NEPA is any change to current restrictions or prohibitions regarding motorized travel by the public (i.e. changing management—changing vehicle class or season-of-use), and any additions or deletions of facilities (roads, trails, or areas) to the NFTS.

- The No Action alternative represents prior NEPA decisions as represented by the 2009 Motor Vehicle Use Map (MVUM).
- Previous decisions on the NFTS do not need to be revisited to implement the Travel Management Rule or the MVUM. That is, the NFTS contains existing facilities (roads and motorized trails) that either underwent NEPA or predate NEPA. Allowing continued motorized use of the facilities in the NFTS in accordance with existing laws and regulations, does not require NEPA.
- *Designation* is typically an administrative act, which does not trigger NEPA. However, in this FEIS, *designation* equates adding UARs to the NFTS. Unauthorized routes (UARs) are not NFTS facilities. Proposals to designate these to the NFTS require a NEPA decision.
- Any UARs not included in Alternatives are not precluded from consideration for designation to the NFTS in future travel management actions under new NEPA.
- Any activity associated with contract, permit, lease or other written authorization is exempt from designation under the Travel Management Rule (36 CFR 212.51(a)(8)) and should not be part of the proposal (i.e. fuelwood permits, motorized SUP permits, mining activity, etc.). Such actions are subject to separate NEPA analysis.
- Dispersed recreation activities that may occur after the motor vehicle stops (i.e. camping, hunting, fishing, and hiking) are not part of the scope of the proposed action. The action and the analysis focus on motor-vehicle use.
- Temporary roads, trails and areas built to support emergency operations or temporarily authorized in association with contracts, permits or leases are not intended for public use. They are not NFTS facilities (e.g., they are unauthorized for public use). Any proposal to designate these temporary roads to the NFTS will require a NEPA decision.

Data

- The route mileages listed in the alternative descriptions in Chapter 2 are based on the forest’s INFRA infrastructure database, and are representative of the routes on the ground. However, due to minor inaccuracies and discrepancies between the various Geographic Information System (GIS) map layers, which are not survey-grade map products, the analysis tools used, and the route mileages used in the analysis of environmental consequences in this chapter are not always the same as the INFRA mileages. The analysis data presented should be considered approximate, but are adequate for general quantitative analysis and useful in evaluating both the effects to the resources (semi-quantitative), and as a comparative tool between alternatives. These minor discrepancies do not change or invalidate any analysis or comparison results derived from their use.

Effects

- Each alternative assumes that other adjacent federal lands will be managed according to the existing management plans and applicable federal laws. Each alternative also assumes that activities on state and private lands will meet applicable state and federal land use regulations.

- Under all action alternatives, all roads and designated motorized trails are assumed open year-round unless resource protection or public safety concerns warrant seasonal closures. Maintenance and stormproofing actions would occur on identified roads and motorized trails to minimize potential impacts.
- Users stay on NFTS roads and designated motorized trails. It is assumed most people are law-abiding, and do not intentionally travel off the NFTS. While no official survey of use of UARs has been completed, Smith River NRA staff estimated 25 percent of the UARs have had some level of use. Therefore, UARs that are not barricaded would be at risk for being used for motorized travel, therefore, barricading all UARs that not designated on the NFTS would reduce the risk of these routes being utilized by motor vehicles. Unauthorized routes that are off roads identified for decommissioning would not need to be barricaded.
- The project-specific Forest Plan amendment to change the Recreation Opportunity Spectrum (ROS) designation from semi-primitive non-motorized to semi-primitive motorized near Blackhawk Bar would not cause effects to any of the resources listed below with the exception of recreation.

Implementation

- Implementation timeline is expected to be 10 to 15 years.
- Routes will not be placed on the MVUM until mitigations are in place (i.e. UARs proposed for designation on the NFTS, as roads or motorized trails need mitigations in place prior to including them to MVUM). Actions/mitigations that would need to occur on a UAR-by-UAR basis includes:
    - Mitigations for POC and water quality (adding rock/gravel, repair/upgrade drainage structures and improve surface drainage),
    - Gate installation Seasonal (POC, water quality, aquatic biota), and year-round,
    - Route delineation to keep vehicular travel on designated road or motorized trail,
    - Noxious weed treatments (noxious weed), and
    - Signage (recreation, naturally occurring asbestos (NOA), transportation).
- NFTS roads and motorized trails will be maintained (see Appendix D).
- During the time period of this NEPA decision, any road or motorized trail may be further restricted or prohibited by order of the forest supervisor if necessary to provide for public safety, prevent resource damage, or otherwise serve the public interest (Forest Plan standard and guideline 18-24 IV-128). The length of the closure order would vary based on the rational for closure. Removing the road or trail from the MVUM would involve public involvement and a new NEPA decision.
- Enforcement of laws and regulations related to travel management will be enforced equally in authority and weight as with all other federal laws and regulations. As with any change in a regulation on National Forest System (NFS) lands, there is usually a transitional period for the public to understand the changes. Once the MVUM is updated, the implementation of the established dedicated

network of motorized trails with signs and user education programs will reduce the number of violations as the users understand and comply with the rules. Providing motorized recreation opportunities in popular, key areas will help relieve pressure to travel off designated routes. Public education and enforcement of travel management restrictions will successfully limit most public motorized use to designated routes. Implementation of additional mitigation measures, such as education, enforcement, and engineering efforts, is expected to effectively manage motorized use in areas prone to violation. Appendix F provides more information about law enforcement.

Air Quality

Introduction

This section describes the affected environment and environmental consequences for air quality. It describes the area potentially affected by the alternatives and existing resource conditions within that area. Measurement indicators are used to describe the existing conditions for the forest. The measurement indicators will be used in the analysis to quantify and describe how well the proposed action and alternatives meet the project objectives and address resource concerns.

The potential exposure to NOA dust generated by motor vehicle traffic exists on UARs that occur on serpentine soils. Serpentine soils have the potential for naturally occurring asbestos to be present. Risk of exposure varies to potential motorist of such routes by various actions and mitigations proposed in the action alternatives. The potential travelways that NOA may be found in are described in the *Geology* section, and the potential hazards to human health and safety, along with design criteria to reduce the effects, are discussed in the *Transportation* section within this chapter.

Analysis Framework: Statute, Regulation, Forest Plan and Other Direction

Air quality is managed through a series of federal, state, and local laws and regulations designed to assure compliance with the Clean Air Act. Following is a summary of how the regulations apply to this project:

Federal Clean Air Act

The federal Clean Air Act (CAA) is the federal law passed in 1970, and last amended in 1990, (42 USC §7401 et seq.) which is the basis for national control of air pollution.

Regional Haze Rule

The Regional Haze Rule (1990 Clean Air Act Amendments), 40 CFR Part 51, requires states to demonstrate *reasonable progress* toward improving visibility in each Class I area over a sixty-year period (to 2064), during which time visibility should be returned to natural conditions. Class I areas include wilderness areas or national parks greater than 5,000 acres which existed on August 7, 1977.

General Conformity Rule

The US Environmental Protection Agency (EPA) passed the final General Conformity Rule (1990 Clean Air Act Amendments) (§176(c) of the Clean Air Act (part 51, subpart W, and part 93, subpart B) in 1993. Under this rule, federal agencies must work with State and local governments in a non-attainment or maintenance area to ensure that federal actions conform to the initiatives established in the applicable state implementation plan (US EPA 2008).

California Clean Air Act

California adopted the California Clean Air Act (CCAA; H&S §§39660 et seq.) in 1988. The Act provides the basis for air quality planning and regulation in California, independent of federal regulations, and establishes ambient air quality standards for the same criteria pollutants as the federal clean air legislation (CARB 2007).

California Air Resources Board (CARB) Off-Road Recreational Vehicle Emissions Standards Rulemaking

In 1994, the CARB approved new off-highway recreational vehicle regulations (since amended in 1998). The rulemaking established emission standards for off-highway vehicles (OHVs) including off-road motorcycles (dirt bikes) and all-terrain vehicles (ATVs) (CARB 2006). OHV registration became contingent on vehicle compliance to California emissions standards. Dirt bikes and ATVs that meet emission standards are eligible for OHV Green Sticker registration and have a year-round operating period, while non-compliant vehicles fall under the OHV Red Sticker program, which has a limited operational season.

Air Quality Management District

The North Coast Unified Air Quality Management District (Air Quality District) covers the forest. The Air Quality District has published rules and regulations that are used to manage air quality within their district. In addition to following these rules and regulations, the ranger districts prepare smoke management plans that contain specific measures that are designed to minimize smoke emissions during prescribed burns.

1995 Six Rivers National Forest Land and Resource Management Plan (Forest Plan).

The Forest Plan includes the following direction related to air quality management:

- National forest activities will be designed and managed to maintain air quality at levels that meet state and/or local government standards and regulations;
- Proper dust abatement measures will be taken prior to any activity that will result in the sustained generation of dust; and
- Maintain Siskiyou Wilderness air quality to, at a minimum, meet state Class II air quality standards.

Effects Analysis Methodology

As described in Chapter 2, the action alternatives include proposals to make limited changes to the existing NFTS, and designate facilities (presently UARs) to the NFTS. The following section describes the analysis methods used to assess the effects of the alternatives on air quality.

Measurement Indicators

The following indicators are used to evaluate the direct, indirect, and cumulative effects of designating facilities (presently UARs) on the NFTS open to public motorized use, upgrading and downgrading existing NFTS, decommissioning roads on the NFTS, and restoring UARs:

- Miles of native surface routes available for public motorized use within one mile of Class I airsheds (Redwood National Park), and
- Miles of native surface routes available for public motorized use within one mile of Class II airsheds (Siskiyou Wilderness).

Rationale: Motor vehicles generate dust (particulate matter) and ozone-forming emissions. Miles of native surface UARs within or adjacent to Class I and II wildernesses is used to compare the dust-production potential of each alternative to existing levels.

Assumptions specific to Air Quality Analysis

Proposed changes to the existing NFTS (such as changes in vehicle class and season of use) will not be considered further in this analysis. Motor vehicles can already use NFTS roads.

Prohibiting use of those roads by different types of vehicles will have no measurable direct, indirect, or cumulative effect on air quality as it is anticipated that the current and projected level of OHV activity is relatively low compared to other forests and recreation activities on the SRNF. This assumption is based on the following:

- Seventy percent of forest visitors came from the north coast (MVUM 2008).
- It is assumed that the project area experiences similar visitor demographics.
- The population and growth trends for Del Norte County as described in the *Society and Culture* section in this chapter follow the same trends as experienced in the past into the foreseeable future, which typically has a lower rate of growth than the state of California.

Affected Environment

Topography and weather patterns determine the extent to which airborne particulate matter accumulates within a given area. Weather patterns strongly influence air quality through pollutant dispersion. The primary weather conditions that affect dispersion are atmospheric stability, mixing height and transport wind speed. Atmospheric stability refers to the tendency for air to mix vertically through the atmosphere. Mixing height is the vertical distance through which air is able to mix. The transport wind speed is a measure of the ability to carry emissions away from a source horizontally. These factors determine the ability of the atmosphere to disperse and dilute the released emissions.

The general climate of the forest varies considerably with elevation and proximity to the coast. The Gasquet and northern Orleans ranger districts have a maritime climate, with cool to mild temperatures, and wet winters, with much drier, but still mild summers. At the other extreme, the southern portion of the forest, the Mad River District climate varies from temperate to Mediterranean, being generally removed from the cool ocean effects. Most precipitation is connected with winter storms that move inland from the Pacific. The moist air ascends as it moves across the coastal mountains, and associated orthographic lifting results in a considerable increase in rainfall and intensity.

In general, winds in the river drainages are associated with daily diurnal winds and sea breezes are channeled inland by the topography and add to the local upcanyon winds. These winds are strongest in mid-to-late summer in the major river drainages, with 12 to 16 mile per hour up-canyon winds during the late afternoons and in the evening on a daily basis.

Air quality across the forest is generally considered good to excellent due to low population density and the remote nature of the forest. Air quality can be and has been severely impacted by particulate matter (PM) and other pollutants during large wildfire events on the forest. A State of Emergency was declared due to smoke impacts both during the Megram Fire (1999) and the 2008 wildfire events.

Except during these extreme events, all federal standards of air quality are consistently achieved across the entire forest (including those for ozone, carbon monoxide, particulate matter (PM 2.5 and PM 10), and nitrogen dioxide). The overall area is considered to be in *attainment* by federal standards, and it has previously met and currently meets ambient air quality standards.

Visibility across the forest is also considered good, except during major wildfires. During the Megram Fire (1999) and the fires of 2008, visibility was often reduced to 20 feet. Several times during this fire, imaging and suppression aircraft were prevented from flying due to dense smoke. The clear visibility of the Siskiyou Wilderness was severely degraded throughout the duration of these large fire events. The Gasquet Ranger District contains a portion of the Siskiyou Wilderness, which is a Class II Wilderness. Visibility was also degraded for this wilderness during the 2008 fire season.

Fugitive Dust

Atmospheric dust arises from the mechanical disturbance of granular material exposed to the air. Dust generated from these open sources is termed *fugitive* because it is not discharged to the atmosphere in a confined flow stream. Common sources of fugitive dust include native surface roads, agricultural tilling operations, aggregate storage piles, and heavy construction operations. In the project area, native surface roads are the most common source of fugitive dust.

Fugitive road dust is a result of motor vehicle use when road surfaces are dry; the force of wheels moving across the native surfaces causes pulverization of surface material. Dust is lofted by the rolling wheels as well as by the turbulence caused by the vehicle itself. This air turbulence can persist for a period after the vehicle passes.

The quantity of dust emissions from a given segment of native surface road varies linearly with the volume of traffic. Variables which influence the amount of dust produced include the average vehicle speed, the average vehicle weight, the average number of wheels per vehicle, the road surface texture, the fraction of road surface material which is classified as silt (particles less than 75 microns in diameter), and the moisture content of the road surface (US EPA 2002).

The impact of a fugitive dust source on air quality depends on the quantity and drift potential of the dust particles injected into the atmosphere. In addition to large dust particles that settle out near the source, considerable amounts of fine particles also are emitted and dispersed over much greater distances from the source. Theoretical drift distance, as a function of particle diameter and mean wind speed, has been computed for fugitive dust emissions. Results indicate that, for a typical mean wind speed of 10 mph, particles larger than about 100 microns in aerodynamic diameter are likely to settle out within 20 to 30 feet from the edge of the route or other point of emission. Particles that are 30 to 100 microns in diameter are likely to undergo impeded settling. These particles, depending upon the extent of atmospheric turbulence, are likely to settle within a few hundred feet of the route. Smaller particles have much slower gravitational settling velocities and are much more likely to have their settling rate retarded by atmospheric turbulence.

Particulate Matter (PM 10 and PM 2.5)

Sources of PM 10 emissions include wood burning stoves from residential areas; smoke from pile burning, broadcast burning, and wildfires; and re-suspended road dust and cinders. The finer particles of PM 2.5 primarily come from car, truck, bus and off-road vehicle (e.g., construction equipment, snowmobile, locomotive) exhaust; other operations that involve the burning of fuels such as wood, heating oil or coal; and natural sources such as forest and grass fires.

The EPA and the CARB regulate these particles to protect visibility and human health. The federal 24-hour ambient air quality standard is 150 micrograms per cubic meter for PM 10 and 35 micrograms per cubic meter for PM 2.5 (US EPA 2008). The entire forest is in attainment for federal standards of both PM 10 and PM 2.5.

Outdoor air levels of fine particles (PM 2.5) and inhalable coarse particles (PM 10) increase during periods of stagnant air (very little wind and air mixing), when the particles are not carried away by wind, or when winds bring polluted air into the area from outside sources. In general, as the levels of PM 2.5 in outdoor air increase, the air appears hazy and visibility is reduced. These conditions are similar in appearance to high humidity or fog.

Ozone

Ozone is a secondary pollutant formed by complex photochemical reactions of nitrogen oxides (NOx) and volatile organic compounds in the presence of sunlight. Motor-vehicle exhaust and industrial emissions, gasoline vapors, and chemical solvents as well as natural sources emit nitrogen oxides and volatile organic compounds that help form ozone. Currently the ozone, eight-hour federal standard is 0.075 parts per million (ppm). The entire forest is currently in attainment for the ozone eight-hour standard (US EPA 2008).

Existing Conditions in Class I Airsheds

The Clean Air Act Amendments of 1977 require that a program be established to prevent degradation of air quality in pristine areas and protect air quality related values of Class I areas. Designation as a Class I area allows only very small increments of new pollution above already existing air pollution levels. Class I areas include national parks and national wilderness areas greater than 5,000 acres in existence on August 7, 1977, when the amendments were signed into law. Redwood National Park is immediately adjacent to the Gasquet District. The nearest US Forest Service (Forest Service or USFS) managed Class I area is the Kalmiopsis Wilderness, which is just 2.25 miles north of the Gasquet District in the State of Oregon. Within Class I areas, visibility is the air quality related value that is most affected, especially by fugitive dust. Particulates that remain suspended in the atmosphere are efficient light scatterers, and therefore, contribute to regional haze. The air quality related value of visibility is considered good to excellent most of the time in Class I airsheds, except during major wildfires.

Environmental Consequences

In the following section, the effects of the alternatives are analyzed to determine the potential for public motor-vehicle travel to cause or contribute to violations of National Ambient Air Quality standards (NAAQs), degrade air quality, affect Class I areas, or to cause or contribute to visibility impairment beyond the existing conditions.

Alternatives 1, 4, 5 and 6

Direct and Indirect Effects

The number of vehicle miles traveled annually by forest users is not expected to change in any of the alternatives through the prohibition of cross-country travel and the redirection of motorized use onto a designated system of roads and trails. As a result, adverse effects to air quality (i.e. effects that would cause or significantly contribute to air quality impairment beyond the existing conditions) are not anticipated for any of the alternatives. This determination is based on the following:

- Emissions from unpaved roads are not a primary source of PM 10 or PM 2.5 in the study area.
- None of the alternatives propose roads, motorized trails, or areas that would result in a significant increase or change in concentration of use. Use levels for the vast majority of roads are light (less than 25 trips per week) to low (25 to 100 trips per week, mainly during hunting season). In addition, many of the proposed motorized trails are short spurs off NFTS roads. Since many of the routes do not provide through access and receive very low use, reductions in the miles of UARs at risk of receiving motorized use (i.e. not currently physically closed to motorized use) are not expected to result in major changes in use levels on designated routes.

  Adjacent to Class I and II airsheds, motor vehicle use of native surface UARs would continue to produce dust and emissions at or below current levels. Less than one mile of routes would be designated for motorized use within one mile of either a Class 1 or II airshed for Alternatives 4 through 6. In the existing condition, less than 1 percent of the total UARs on the forest are located within one mile of a Class I airshed. Fugitive dust generated from UARs impacting visibility in Class 1 airsheds is of very low concern. The relative contribution of any of the alternatives to visibility concerns within Class I airsheds is expected to be negligible.

Unauthorized route mileage across the forest is low and their use is light to low, so use of these routes would not cause the forest to be in non-attainment for ozone production. Recreational travel on the UARs will not cause or significantly contribute to violations of the NAAQs in the existing condition or the action alternatives.

- For all of alternatives, direct and indirect effects of vehicle emissions on air quality would not result in measurable variations from current conditions with respect to PM 10, PM 2.5 and ozone emissions.

Cumulative Effects

Present and reasonably foreseeable future actions within the project area that would affect local air quality (particulate matter and visibility) include smoke from wildland fires and wood burning.

Recreational OHV use is the primary present and foreseeable future activity relevant to this discussion of cumulative effects to air quality. Most of the roads and trails in this area are part of the existing NFTS; UAR mileage is extremely limited. Although the study area is a destination for recreational OHV use, the relative contribution of emissions in this area to levels of ozone, particulate matter, or fugitive dust is considered to be low because proposals to designate routes to the NFTS would not result in measurable adverse cumulative effects to air quality related issues, given the extremely limited mileage designated within one mile of either Class I or II wilderness.

Global climate change must also be included in the discussion of the cumulative effects of this project. The EPA (2007) developed a *State of Knowledge* paper that outlines what is known and what is uncertain about global climate change. The following elements of climate change are known with near certainty:

- Human activities are changing the composition of Earth's atmosphere. Increasing levels of greenhouse gases like carbon dioxide (CO_2) in the atmosphere since pre-industrial times are well documented and understood.
- The atmospheric buildup of CO_2 and other greenhouse gases is largely the result of human activities such as the burning of fossil fuels.
- An *unequivocal* warming trend of about 1.0° to 1.7°F occurred from 1906 to 2005. Warming occurred in both the northern and southern hemispheres and over the oceans (IPCC 2007).
- The major greenhouse gases emitted by human activities remain in the atmosphere for periods ranging from decades to centuries. It is therefore virtually certain that atmospheric concentrations of greenhouse gases will continue to rise over the next few decades.
- Increasing greenhouse gas concentrations tend to warm the planet.

According to EPA (2007), however, it is uncertain how much warming will occur, how fast that warming will occur, and how the warming will affect the rest of the climate system including precipitation patterns.

Given what is and is not known about global climate change, the following discussion outlines this projects cumulative effects on greenhouse gas emissions and effects of climate change on forest resources.

Carbon dioxide (CO_2), methane (CH_4) and nitrous oxide (N_20) emissions generated by public motor-vehicle travel on NFTS facilities are expected to contribute to the global concentration of greenhouse gases that affect climate change. Projected climate change impacts include air temperature increases, sea level rise, changes in the timing, location, and quantity of precipitation, and increased frequency of extreme weather events such as heat waves, droughts, and floods. The intensity and severity of these effects are expected to vary regionally and even locally, making any discussion of potential site-specific effects of global climate change on forest resources speculative.

Because greenhouse gases from vehicle emissions mix readily into the global pool of greenhouse gases, it is not currently possible to discern the effects of this project from the effects of all other greenhouse gas sources worldwide, nor is it expected that attempting to do so would provide a practical or meaningful analysis of project effects. Potential regional and local variability in climate change effects add to the uncertainty regarding the actual intensity of this project's effects on global climate change. Further, emissions associated with this project are extremely small in the global atmospheric CO_2 context, making it impossible to measure the incremental cumulative impact on global climate from emission associated with this project.

In summary, the potential for cumulative effects is considered negligible for all alternatives because none of the alternatives would result in a measurable change in the level of use, but rather redirect the pattern of use. Redirecting the pattern of use would not result in direct and indirect effects on air quality as it relates to global climatic patterns; therefore, there are no cumulative effects on air quality from any of the alternatives analyzed in detail.

Compliance with the Forest Plan and Other Direction

All standards and guidelines from the Forest Plan related to air quality are met. This approach meets the standards for federal, state and local air quality standards; dust abatement; and Class I and II wilderness areas.

Aquatic Biota

Introduction

Management of aquatic dependent species and habitat, and maintenance of a diversity of animal communities, is an important part of the mission of the Forest Service (Forest and Rangeland Renewable Resources Planning Act of 1974 (RPA), National Forest Management Act of 1976 (NFMA)). Management activities on NFS lands must be planned and implemented so that they do not jeopardize the continued existence of threatened or endangered species or lead to a trend toward listing or loss of viability of Forest Service Sensitive species. In addition, management activities should be designed to maintain or improve habitat for management indicator species (MIS) to the degree consistent with multiple-use objectives established in each forest's forest plan.

Management decisions related to travel management can affect aquatic species by increasing sedimentation to stream habitat from elevated road densities, and allowing routes to encroach in to sensitive riparian and streamside areas. It is Forest Service policy to minimize damage to vegetation, avoid harassment to aquatic dependent species and habitat, and avoid significant disruption of aquatic dependent species and habitat while providing for motorized public use on NFS lands (FSM 2353.03(2)). Therefore, management decisions related to motorized travel on NFS lands must consider effects to aquatic dependent species and their habitat. To address and reduce the potential effects and impacts to aquatic dependent species and habitat, concurrent decommissioning of a portion of a route system and restoration of disturbed landscapes can be an integral part of motorized travel management decisions.

The watersheds of the national forests in the Pacific Northwest provide clean water for communities and support some of the remaining wild runs of salmon, steelhead, and cutthroat trout. In 1994, with the USFS and Bureau of Land Management (BLM) adoption of the Northwest Forest Plan (NWFP), a large network of key salmonid watersheds (i.e. key watersheds) received additional habitat protection and specific management direction to restore stream and riparian habitat at the watershed scale. The NWFP, covering 24 million acres of public lands, is arguably the most ecologically sound multiple-use forest management plan in the world. The NWFP area and the key watershed network include the Smith River basin and the project area addressed in this final environmental impact statement (FEIS).

The Aquatic Conservation Strategy (ACS), a crucial component of the NWFP and the Forest Plan, is a science-based strategy that aims to maintain and restore and the ecological functions and processes of watersheds and aquatic ecosystems. The following section discloses the effects on aquatic species listed under the Endangered Species Act (ESA), those listed as Forest Service Sensitive and the determination of whether the alternatives place watersheds and aquatic ecosystems at risk, or provide for proper functioning, to meet or not prevent attainment of pertinent ACS objectives as described below.

Analysis Framework: Statute, Regulation, Forest Plan, and Other Direction

Endangered Species Act of 1973

The Endangered Species Act (16 USC 1531 et seq.) requires that any action authorized by a federal agency not be likely to jeopardize the continued existence of a threatened or endangered species, or result in the destruction or adverse modification of habitat of such species that is determined to be critical. Section 7 of the ESA, as amended, requires the responsible federal agency to consult the USFWS and the National Marine Fisheries Service (NMFS) concerning threatened or endangered species under their jurisdiction. It is forest service policy to analyze impacts to threatened or endangered species to ensure management activities are not be likely to jeopardize the continued existence of a threatened or endangered species, or result in the destruction or adverse modification of critical habitat.

Southern Oregon/Northern California Coast (SONCC) Coho Salmon Recovery Plan

Released in September 2014, the SONCC coho salmon recovery plan was developed to provide a roadmap to recovery of this species which conservation partners can follow together (NMFS 2014). Specifically, the Recovery Plan was designed to guide implementation of prioritized actions needed to conserve and recover the species by providing an informed, strategic, and voluntary approach to recovery that is based on the best available science. The Smith River was identified as a core population and essential to the recovery of the SONCC coho salmon. Impaired water quality (sediment, turbidity) was determined to be a limiting factor for the watershed as a whole. The recovery plan identified the need to reduce sediment from roads at the watershed level. Actions carried out under this FEIS implement this recovery plan action by decommissioning, stormproofing and upgrading roads as well as restoring drainage patterns of the UARs that were not proposed for designation to the motorized trail system. With the release of the 2014 SONCC recovery plan, SRNF began work on a Watershed and Fisheries Restoration Program (WFR Program) level consultation with NMFS to implement actions identified in that recovery plan and continue to implement watershed restoration actions under the ACS.

Watershed and Fisheries Restoration Biological Assessment (WFRBA)

The WFRBA describes 16 activities (instream, riparian, road decommissioning, culvert upgrades, etc.) that meet the ACS and ESA-listed fish recovery objectives. The programmatic WFRBA describes the processes, design features and checkpoints by which an activity is developed, implemented and monitored. Activities analyzed in the WFRBA were found to have the potential range of determinations: *No Effect*, *Not Likely to Adversely Affect* (negligible or strictly beneficial effects) and *Likely to Adversely Affect* (short-term negative with long-term beneficial) based on the proximity of the activity to occupied habitat, the probability of an effect occurring, and the magnitude of the potential effect on habitat components and individuals. All projects covered under the WFRBA meet the ACS and all Forest Plan standards and guidelines pertaining to anadromous fish species and water quality objectives.

The forest received a biological opinion (BO) on the WFR Program from NMFS, on December 14, 2015, due to the potential for some of the activities covered by the WFR Program have the potential to result in take of ESA-listed salmonids due to heavy equipment operating within occupied habitat or in close proximity to coho habitat. Activities identified in this FEIS would not have equipment occupied habitat.

Analysis of effects of the proposed actions is documented in two biological assessments (BA); the first one prepared in 2007 for the spatially overlapping draft *Smith River Road Management and Route Designation Environmental Assessment* that received a letter of concurrence from NMFS. The second is the recent program level consultation *Watershed and Fisheries Restoration Program Biological Assessment* (WFRBA 2015) for threatened, endangered and Forest Service Sensitive anadromous salmonids. The NMFS agreed that the actions of the Smith River NRA TM were restorative for ESA-listed salmonids and was therefore, in compliance with the *Watershed and Fisheries Restoration Program Biological Opinion (NMFS 2015) prepared in response to the WFR Program BA.* The FEIS incorporates the design features, processes and reporting requirements described in the WFRBA (see Appendix D) and associated WFRBO. This FEIS is consistent with the requirements of the program consultation, including reporting requirements of the NMFS BO.

Smith River NRA Act

Section four of the Smith River NRA Act of 1990 describes the purpose of the Smith River NRA: For the purposes of ensuring the preservation, protection, enhancement, and interpretation for present and future generations of the Smith River watershed’s outstanding wild and scenic rivers, ecological diversity, and recreation opportunities while providing for the wise use and sustained productivity of its natural resources, there is hereby established the Smith River NRA.

1995 Six Rivers National Forest Land and Resource Management Plan (Forest Plan)

The Forest Plan outlines management direction related to roads, as well as resource protection and watershed restoration related to road use and management. This proposal is consistent with Forest Plan management direction for the project area.

Forest Plan Management Areas

The Smith River NRA is managed under direction provided by eight management areas (or zones). The following areas provide the primary direction for managing aquatic resources:

- **Management Area 7 – Smith River NRA:** The Smith River NRA was established in November 1990, by SB 2566/HB 4309. The primary goals are to emphasize, protect, and enhance the unique biological diversity; anadromous fisheries; and the wild, scenic, and recreational potential of the Smith River while providing sustained yields of forest products.

  The Smith River NRA Act legislated specific statutes. The Smith River NRA management plan (Appendix A of the Forest Plan) provides direction to guide compliance with those statutes.

- **Management Area 9 – Riparian Reserves:** Riparian reserves are one of the four components of the ACS as well as a land allocation. Their purpose is to maintain and restore riparian structures and functions to intermittent streams, confer benefits to riparian-dependent and associated species other than fish, enhance habitat conservation for organisms that are dependent on the transition zone between upslope and riparian areas, improve travel and dispersal corridors for many terrestrial animals and plants, and provide for greater connectivity of the watershed. The RRs would also serve as connectivity corridors between late-successional reserves (LSRs).

  The riparian reserves management direction includes restoration of riparian structures and functions, as well as habitat conservation, improved dispersal habitat, and maintenance of habitat connectivity. Aquatic and riparian habitat has been degraded due to unregulated vehicle access and recreational use, and need protection in order to recover and provide for the needs of fish and wildlife. The proposed action alternatives would improve riparian conditions by removing unneeded routes, and upgrading and stormproofing needed routes to reduce erosion and sediment delivery. The proposed action alternatives are consistent with RR management direction.

Forest Plan Aquatic and Riparian Ecosystems Direction

Pages IV-106 through IV-111 of the Forest Plan includes direction for managing and protecting aquatic and riparian ecosystems, with specific standards and guidelines for managing roads and vehicle access to protect fisheries and other aquatic biota, water quality, and riparian vegetation. Also included in this section of the Forest Plan is the direction for key watersheds. As part of the NWFP ACS, key watersheds are intended to provide a system of large refugia that are crucial to at-risk fish stocks and provide high water quality. Relevant facets of managing key watersheds are included in this section, including the specific requirement of *no net gain* in road miles. Forest Plan standard and guideline 9-17 (p. IV-111) states that watershed restoration should focus on removing and upgrading roads. The Smith River basin is designated as a key watershed. The proposed project will reduce road miles across the district. There will be no net gain in road miles.

Aquatic Conservation Strategy (ACS)

The ACS is intended as a means to restore and maintain the ecological health of watersheds and aquatic ecosystems contained within them on public lands. The strategy would protect salmon and steelhead habitat on federal lands managed by the Forest Service and Bureau of Land Management within the range of the NSO.

To make the finding that an action *meets* or *does not prevent attainment* of the nine objectives (listed below), the analysis describes the properly functioning range and current baseline status of environmental indicators, and compare those values to the values expected to result from the effects of the proposed action (Correspondence: Compliance with ACS, May 22, 2007). So the ACS analysis includes: 1) a description of the existing baseline condition, 2) a description of the properly functioning range of natural variability of the important physical and biological components of a given watershed (i.e. indicators), and 3) how the proposed project or management action maintains the existing condition or moves it toward the properly functioning range of natural variability (i.e. effects of the proposed action). The environmental indicators are grouped into pathways that are intended to link to the nine ACS objectives. Management actions that do not maintain the existing condition or contribute to improved conditions in the long-term would not meet the intent of the ACS and thus, should not be implemented.

Implementation of the ACS is the main emphasis this project to aid recovery of fish habitat, riparian habitat, and water quality. The proposed restoration and road decommissioning actions, as well as other route treatments, would result in watershed-scale improvements in the Smith River basin and therefore is the on-the-ground implementation of the ACS.

To facilitate achieving the ACS objectives, four components were established. These four components are riparian reserves, key watersheds, watershed analysis, and watershed restoration. Implementation of these components are intended to operate together to maintain and restore the productivity and resiliency of riparian and aquatic ecosystems. These four components are integral to the development, design, and implementation of this project and ensure consistency with ACS objectives.

Riparian Reserves

Riparian reserves are Forest Plan land allocations based on streamside corridors where riparian resources receive primary emphasis and where special riparian reserve standards and guidelines apply. Standards and guidelines for riparian reserves prohibit and regulate activities that prevent attainment of the ACS objectives. Riparian reserves were delineated as part of the process of the 1995 NWFP amendment to the SRNF’s Forest Plan. Riparian reserve standards and guidelines are in the Forest Plan on pages IV-46 to IV-50. This project is designed to restore and protect riparian reserves, decommission identified roads, restore areas disturbed by UARs that pose a high risk to aquatic and riparian biota and habitats, and meet the intent of the riparian reserve component of the ACS.

Key Watersheds

The intent of this ACS component is to provide a system of key watersheds that serve as refugia for maintaining and recovering habitat for at-risk stocks of anadromous salmonids and resident fish species. These refugia include areas of high quality habitat as well as areas of degraded habitat. Key watersheds with high quality conditions intended to serve as anchors for the potential recovery of depressed stocks. The entire Smith River basin is a high quality key watershed. Actions within key watersheds would be implemented in a manner consistent with guidance for management within these areas. The intent of activities in these areas would be focused on recovery of Pacific salmonids. Actions designed to reduce the negative effects of the existing road-related infrastructure on aquatic habitats and habitat restoration is emphasized within key watersheds.

The proposed restoration and road decommissioning actions, as well as other route treatments, would result in watershed-scale improvements in the Smith River basin and meet the intent of the key watershed component of the ACS.

Watershed Analysis

As one of the principal analyses that used in making decisions on implementation of the ACS, watershed analysis is required in key watersheds, for roadless areas in non-key watersheds and riparian reserves prior to determining how proposed land management activities meet the ACS objectives. Watershed analyses have been completed for the entire Smith River basin (1995).

The proposed restoration and road management actions are based on findings of several watershed-scale analyses, including the Smith River basin assessment and sub-basin watershed analyses, and subsequent Smith River NRA road condition inventories and travel analyses, including the *Smith River NRA Roads Analysis Process/Off-Highway Vehicle Strategy* (*Smith River NRA RAP/OHV Strategy*). The *Smith River NRA RAP/OHV Strategy* identified all potential resources risks for every route on the Gasquet District, and developed management recommendations to address those risks. These analyses provide the initial recommendations for route treatments that would increase protections for aquatic and riparian habitats.

Watershed Restoration

Watershed restoration is designed to recover degraded habitat and to restore critical ecological processes that create and maintain favorable environmental conditions for aquatic and riparian-dependent biota. To address and reduce the potential effects and impacts to aquatic dependent species and habitat, concurrent decommissioning of a portion of a route system and restoration of disturbed landscapes can be an integral part of motorized travel management decisions.

Watershed restoration is an integral part of the Purpose and Need of this project and will be a primary emphasis during project implementation to aid recovery of fish habitat, riparian habitat, and water quality. The proposed restoration and road decommissioning actions, as well as other route treatments, would result in watershed-scale improvements in the Smith River basin and meet the intent of the watershed restoration component of the ACS.

Forest Service Manual and Handbooks (FSM/H 2670)

Forest Service Sensitive species are plant species identified by the regional forester for which population viability is a concern. The Forest Service develops and implements management practices to ensure that rare plants and animals do not become threatened or endangered and ensure their continued viability on national forests. It is forest service policy to analyze impacts to Sensitive species to ensure management activities do not create a significant trend toward federal listing or loss of viability. This assessment is documented in the *Aquatic Biota Specialist Report* and biological evaluation (2016) and is summarized or referenced in this chapter.

Effects Analysis Methodology

The aquatic analysis methodology focuses on consistency with the ACS, by addressing effects to aquatic biota and their habitat uses and the resulting direct and indirect effects to threatened, endangered, proposed, and Forest Service Sensitive aquatic species. The analysis is based on a standardized set of pathways and indicators organized into a matrix that was developed from the NWFP ACS and adopted by the USFS and NMFS. Indicators are those identified in the methodology *Making Endangered Species Act Determinations of Effect for Individual or Grouped Actions at the Watershed Scale* (NMFS 1996).

The indicators are used to determine consistency with the ACS by disclosing effects to aquatic biota, and if any of the action alternatives (or their components) *meets* or *does not prevent attainment* of the objectives of the ACS. This indicator analysis method describes the existing baseline condition (summarized by indicator in the matrix), including the properly functioning range of natural variability of each indicator that is necessary to meet the ACS objectives and benefit the relevant aquatic species, and how the project maintains the existing condition or moves it toward the properly functioning range of natural variability. The complete analysis of indicators is located in the *Aquatic Biota Specialist Report* (2016).

Process

1. Identify the proposed management activities or their components that have the potential to impact threatened or endangered and Forest Service Sensitive aquatic species with a focus on SONCC coho habitat and their designated Critical Habitat.
2. Describe the environmental baseline for the Smith River basin using the matrix pathways and indicators in order to frame the context of the proposed management activities on the baseline—both in terms of recovery actions and potential impacts. Identify indictors potentially affected by management activities to carry forward to direct and indirect effects analysis.
3. By individual watersheds, identify which proposed management activities occur adjacent to SONCC coho listed habitat (or Forest Service Sensitive aquatic species).
4. Using analysis conclusions from hydrology, soils and geology summarize direct, indirect and cumulative effects by alternative based on proximity of the actions and baseline conditions.

Proposed Management Actions

- **Changes to NFTS and Restoration of Drainage Patterns on Inventoried UARs.** When these two actions include ground disturbance, they have the potential to effect aquatic species by introducing sediment (negative) as well as to reduce the risk of road failure (decommissioning, culvert removal), reduce the amount of sediment entering the channel and prevent impacts from occurring have to potential to effect (road upgrades, season of use).
- **Mitigations.** Mitigations apply to NFTS current and proposed roads and motorized trails to reduce risk to water quality and aquatic species have the potential to reduce the risk of impacts.

Assumptions

- Not all of the ACS indicators under the pathways matrix would necessarily be changed or influenced by limited changes to the NFTS. Therefore, in many cases, the effect of individual changes to the NFTS and restoration would be a combination of improving and maintaining other indicator values.
- Habitats for the species being analyzed were assumed to be occupied if they contained the necessary life history elements and were located below longstanding natural barriers.
- A thorough matrix analysis for project effects to aquatic species also yields an effective analysis of project effects to the features and functions of Primary Constituent Elements (PCEs) for Critical Habitat and essential fish habitat.
- All vehicle types result in the same amount of disturbance effect on aquatic dependent species. Therefore, proposals to reclassify existing system roads as motorized trails would have no effect on aquatic systems and would not be considered further in this analysis.
- Research has concluded that sediment from roads can result in adverse effects to streams and aquatic habitats (Dissmeyer 2000, Gucinski et al. 2001, Meahan 1991).
- The overall effect of roads to aquatic habitats is related to the amount of sediment movement from road surfaces and is highly variable within and among surface types and is related to levels of maintenance and road drainage and type of use of the road (Clinton and Vose, 2003; Maholland, 2002; Maholland and Bullard, 2005).
- The elimination of vehicle traffic on a road near a stream during periods of wet road conditions would result in less sediment being delivered from the road to the stream to benefit aquatic habitats.
- Improving indicators would result in improved watershed conditions for all threatened or endangered and Forest Service Sensitive aquatic species residing within the Smith River.
- Direct effects to threatened, endangered proposed, or Forest Service Sensitive species is possible only where routes cross occupied habitat and the potential for harm could occur through disturbance or crushing. However, none of the activities proposed occur within occupied habitat therefore direct effects to individuals would not occur.

Data Sources

The latest federal species list for the project area was obtained from the US Fish and Wildlife Service (USFWS). Currently the Service is developing the IPAC website for agencies to obtain federal species lists, but the results of species lists are not yet reliable. On September 7, 2016, the Level 1 team reviewed the January 14, 2014 species list obtained from the USFWS and determined it was still valid for this project area. The Region 5 Forest Service Sensitive aquatic species list was identified from the *US Forest Service, Pacific Southwest Region Sensitive Animal Species List*, September 9, 2013.

Assessment of environmental baseline and use of indicators and pathways (groups of indicators) follows *Making Endangered Species Act Determinations of Effect for Individual or Grouped Actions at the Watershed Scale* (NMFS 1996). Information regarding fish habitat baseline conditions of the Smith River is derived primarily from these sources: 1) SRNF fish surveys habitat inventories (including Level II surveys from Siskiyou Research Group and the Smith River Alliance) for Hurdygurdy, Craigs, Coon, Gordon, Rock, Boulder, Jones, Goose, Cant Hook, Patrick, Shelly, Monkey, Griffin, Siskiyou Fork, Myrtle, Hardscrabble, and Middle, South, and North Fork Smith, 2) stream survey reports from the California Department of Fish and Game, 3) the Fox Unit Monitoring Fishery Reports for upper South Fork Smith tributaries (USFS 1976 through 1985), and 4) the Smith River Ecosystem Analysis (McCain et al. 1995).

Analysis of watershed and road conditions (and effects) is based on *Road Assessment and Restoration Planning in the Smith River Basin* (Ledwith 2003a, Ledwith 2003b). These analyses address current and potential sediment sources, road density and location, drainage network increases, and effects from road drainage features, such as stream crossings; and use methods outlined in *Assessment and Implementation Techniques for Controlling Road-Related Sediment Sources* (Hagans and Weaver 1997), *Methods for Inventory and Environmental Risk Assessment of Road Drainage Crossings* (Flanagan et al. 1998).

Watershed condition data were also compiled from *Rating Watershed Condition: Reconnaissance Level Assessment for the National Forests of the Pacific Southwest Region* (USDA Forest Service, Draft 2.4, April 2000). This report was part of a regional USFS effort to evaluate watershed condition and identify effects. Watersheds were delineated at the 5th-field scale for NFS lands, which includes all of the Smith River NRA and Gasquet District lands. The following watershed information is general to the entire action area. More specific watershed data is included for project activities in close proximity to coho salmon Critical Habitat.

Distribution and critical habitat information upon which the effects analysis was based on current known SONCC coho distribution based on historic and current surveys (SRNF surveys, CalFish database, NMFS etc.). Critical habitat for SONCC coho was not spatially identified but rather described in the Federal Register as all river reaches accessible to coho salmon.

Final EIS sections for watershed, soils, POC and geology provide analysis that supports the analysis of indicators and the ACS consistency analysis.

Affected Environment

The Smith River is well known for its inherent clarity and low turbidity. Turbidity levels are very low and are reflective of the hard ultramafic rock and coarse parent material, and the subsequesnt coarse substrate that dominates streams of the Smith River basin. Turbidity data has been recorded during storms following wildfire—an indication of the expected level of ash delivered from hillslopes into channels during storms. One of the highest turbidity readings for the Smith basin was observed in November 16, 2002 during the first major storm that followed the Biscuit Fire of 2002, where turbidity (presumably from ash runoff) peaked at 74 turbidity units at 8:45 PM. The turbidity dropped back to 8 by 8 PM the following day. The stream maintains a low turbidity level during a very high storm flow (greater than100-year return interval) and recovers very quickly from a large pulse of wildfire ash. The SONCC recovery plan identifed the middle and upper Smith River as having good water quality.

Water temperature in mainstems of the Smith River is beneficial to threatened, endangered, or Sensitive fish and other biota, and ranges from 5°C in winter (in tributaries) to 23°C in late summer (40° to 75°F) (USFS 1976 to 1985). Due to the proximity to the coast and the maritime rain precipitation patterns, stream temperatures rarely approach the freezing piont. Shade is provided mainly by red alder, bigleaf maple, Douglas-fir, incense cedar, and POC. Some dense shading from redwood occurs in the western part of the project area. In the anadromous reaches of the Smith River, shade canopy ranges from 20 to 83 percent (USFS 1976 through 1985). The range in water temperature in the Smith River is properly functioning.

The road system directly affects riparian communities where it impinges on riparian areas. Roads can indirectly affect riparian communities by intercepting surface and subsurface flows and routing these flows so that riparian areas dry up and the riparian vegetation is replaced with upland vegetation. Riparian plant communities play a vital role in providing shade. Removal or degradation of these communities can affect stream stability and water temperatures, which in turn, affects aquatic habitat.

The condition and function of the riparian reserves varies throughout the project area. Functions provided by the riparian reserves that are important for aquatic threatened, endangered, or Sensitive species include shade canopy, large woody debris production from the mortality and recruitment of mature trees, protection of small floodplains important for overwintering habitat, and production of nutrient and food sources. As described above, the shade canopy is currently adequate to maintain stream temperatures within the range necessary for productive salmonid habitat.

Pathways and Indicators for the Smith River Basin

The matrix of pathways and indicators is designed to summarize important environmental parameters and levels of condition for each. This matrix is divided into six overall *pathways*: water quality, channel condition and dynamics, habitat access, flow/hydrology, habitat elements, and watershed conditions. Each of these represents a significant pathway by which actions can have potential effects on anadromous salmonids and their habitats. The pathways are further broken down into *indicators*.

The columns in the matrix correspond to levels of condition of the indicator. There are three condition levels: *properly functioning*, *at risk*, and *not properly functioning*. For each indicator, NMFS established a numeric value or range for a metric that describes the condition, a description of the condition, or both. When a numeric value and a description are combined in the same cell in the matrix, it is because accurate assessment of the indicator requires attention to both. The following table (Table 3-1) summarizes the analysis of habitat indicators for the Smith River basin. The complete analysis is found in the *Aquatic Biota Specialist Report* and biological evaluation.

Table 3-1. Pathways and indicators for the Smith River Basin.

	Properly Functioning	At Risk	Not Properly Functioning
Water Quality			
Temperature			
Sediment and Turbidity	turbidity	sediment	
Chemical Contaminants and Nutrients			
Habitat Access			
Physical Barriers			
Habitat Elements			
Substrate			
Large Woody Debris			
Pool Frequency			
Pool Quality			
Off-Channel Habitat			
Refugia			
Channel Condition and Dynamics			
Width to Depth Ratio			
Streambank Condition			
Floodplain Connectivity			
Flow and Hydrology			
Peak and Base Flows			
Drainage Network Increase			
Watershed Conditions			
Road Density and Location			
Disturbance History			
Riparian Reserves			

Species Considered

The following species (Table 3-2 and subsequent text) are known to occur in the project area. See the *Aquatic Biota Specialist Report* and biological evaluation for additional species life history information.

Table 3-2. Species known to occur in the project area.

Species	Status	Critical Habitat Designated	Essential Fish Habitat
Coho Salmon (*Oncorhynchus kisutch*) Southern Oregon/Northern California Coasts (SONCC)	T	Yes	Yes
Chinook salmon (*Oncorhynchus tshawytscha*) SONCC ESU	FSS	n/a	Yes
Steelhead (*Oncorhynchus mykiss*) Klamath Mountain Province (KMP)	FSS	n/a	n/a

Species	Status	Critical Habitat Designated	Essential Fish Habitat
Coastal cutthroat trout (*Oncorhynchus clarkii*) Southern Oregon/ California Coasts (SOCC) DPS	FSS	n/a	n/a
Pacific lamprey (*Entosphenus tridentatus*)	FSS	n/a	n/a
California Floater (*Anodonta californiensis*)	FSS	n/a	n/a
Chace Juga (*Juga chacei*)	FSS	n/a	n/a
Pristine springsnail (*Pristrinicola hemphilli*)	FSS	n/a	n/a

Federally Threatened, Endangered, or Proposed Species

- **Coho Salmon** (*Oncorhynchus kisutch*): SONCC evolutionary significant unit (ESU), and designated Critical Habitat.

  Status: Federally threatened

Both historical and recent abundance trends have been described by NMFS in their coast-wide status review (Weitkamp et al. 1995, pp. 110-111). Most of the information for the northern California region of this ESU was recently summarized by the California Department of Fish and Game. They concluded, "Coho salmon in California, including hatchery stock, could be less than 6 percent of their abundance during the 1940s, and have experienced at least a 70 percent decline in numbers since the 1960s." They also reported that coho salmon populations have been virtually eliminated in many streams and that adults are observed only every third year in some stream, suggesting that two or three brood cycles may already have been eliminated.

An *Updated Status of Federally listed ESUs of West Coast Salmon and Steelhead* (including coho salmon) was completed in June 2005 (Good et al. 2005). The status update included limited new information for coho salmon. In the status update, the BRT stated that, "None of these data contradict the conclusions the BRT reached previously, nor do any data (1995 to present) suggest any marked change, either positive or negative, in the abundance or distribution of coho salmon within the SONCC ESU."

The NMFS describes coho salmon within the Smith River basin as a functionally independent population (Williams et al. 2006). Functionally independent salmon populations can serve primary roles in salmon ESU recovery. Coho salmon in the Smith River basin primarily occur in tributaries of the lower mainstem, particularly Mill Creek and Rowdy Creek. The 2014 Recovery Plan identified the Smith River population as a core population necessary to the recovery of the ESA as a whole (NMFS 2014). Coho salmon occurrence in the Smith River NRA has been low over the past 30 years, as indicated by annual spawning and juvenile fish surveys since 1976. Adult and juvenile coho are not observed in survey reaches on the Smith River NRA every year, but rather sporadically. Spawning and juvenile coho have been observed sporadically in the low-gradient and gravel-rich reaches of large 6th-order tributaries of the North, South, and Middle Forks Smith River, including Hurdygurdy, Patrick, and upper North Fork Smith. Juvenile coho were observed in Hurdygurdy and Patrick Creeks in 1991, and recently in the upper South Fork Smith in 2012 and 2013, and North Fork Smith (outside the Smith River NRA) in 2012 and 2013.

Critical Habitat. The NMFS designated Critical Habitat for SONCC coho salmon, on May 5, 1999, that encompasses coho-accessible reaches of all rivers (including estuaries and tributaries) between Cape

Blanco, Oregon and Punta Gorda, California. Analysis of SONCC coho Critical Habitat on the SRNF is based on known or suspected coho habitat found within a watershed. Critical habitat excludes reaches located above longstanding natural impassable barriers (i.e. natural waterfalls in existence for at least several hundred years). Southern Oregon/Northern California Coast coho Critical Habitat is derived from available historical fish species inventories, and habitat assessments on record at the forest supervisor's office.

Essential Fish Habitat (EFH). The 1996 amendments to the Magnuson-Stevens Fishery Conservation and Management Act (MSA) set forth a number of new mandates for NOAA Fisheries, regional fishery management councils, and federal action agencies to identify and protect important marine and anadromous fish habitat. Effects to EFH related to this project were analyzed using habitat defined by the SRNF as known or suspected coho and chinook habitat. Essential fish habitat for coho and chinook were derived from available historical fish species inventories, and habitat assessments on record at the forest supervisor's office.

Forest Service Sensitive Species

The information below is summarized from the *Aquatic Biota Specialist Report* and biological evaluation (2016). The species below spend their entire life cycles in the stream environment.

- **Chinook salmon** (*Oncorhynchus tshawytscha*): SONCC ESU; (see above for Essential Fish Habitat).

Chinook salmon require cool water, diverse and complex habitat and clean gravels to successfully reproduce. Habitat needs of Chinook salmon fry change rapidly from the time of emergence to time of smolting, but generally require cool water and instream cover. Chinook salmon spawn in the major tributaries of the Smith River. Annual surveys occur to identify locations and number of spawning Chinook.

- **Steelhead** (*Oncorhynchus mykiss*): Klamath Mountain Province Distinct Population Segment (DPS)

Steelhead require cool water, diverse and complex habitat, and clean gravels to reproduce successfully. Spawning typically occurs in winter. Habitat needs of steelhead vary with season of year and life cycle stage. Substrate composition, water quality, and water quantity are important habitat elements for steelhead before and during spawning. First- and second-order streams, which generally include permanently flowing non-fish bearing streams and seasonally flowing or intermittent streams, are sources of water, nutrients, wood, and other vegetative material. Both summer and winter runs of steelhead are found in the major Smith River tributaries.

- **Coastal cutthroat trout** (*Oncorhynchus clarkii*): Southern Oregon/California Coasts DPS

Cutthroat require cool water, diverse and complex habitat, and clean gravels to reproduce successfully. Habitat needs of cutthroat are similar to coho. These streams are cool (18° C), well shaded, with abundant vegetative overhang. Fry require slower and shallower waters than older stages. Adults over wintering in streams, utilize pools with fallen logs or undercut banks, but will use pools with boulders if adequate (Gerstung 1993). Spawning habitat includes small to moderate-sized gravel substrates. Embryonic survival is inversely related to amount of fine sediment present (Moyle et al. 1995). Adults usually choose the tails of pools to spawn in, preferring the headwater tributaries of larger streams.

Resident and anadromous cutthroat are found in the Smith River drainages. Jones Creek contains a population of resident cutthroat trout above a barrier near the confluence with the Middle Fork Smith.

- **Pacific lamprey** (*Entosphenus tridentatus*)

Pacific lampreys apparently still occupy much of their native range, but existing evidence suggests that large declines in the past 25 to 50 years may be pervasive. We do know that they no longer have access to upstream habitats that are blocked by large dams. The large runs that once characterized coastal streams such as the Eel and Klamath rivers, based on anecdotal information, seem to be gone. Generally, lamprey redds are found in similar locations as salmonids and may be identified as round depressions in gravel or cobble substrates. Lamprey require slow backwater areas for rearing (up to seven years are spent filter feeding in these areas before migrating out to the ocean. Little information exists on the distribution of lamprey in the Smith River.

- **California floater** (*Anodonta californiensis*)

Anodonta californiensis occurs in *lakes and slow rivers* (Taylor 1981), “generally on soft substrates (mud-sand), in fairly large streams and lakes only, in relatively slow current; a low elevation species” (Frest and Johannes 1995). Howard and Cuffey (2003) found that *A. californiensis* was almost exclusively found in pools, with no occurrences in riffles and very few in runs in the South Fork of the Eel River. There is no known record of populations on the Smith River.

- **Chace juga** (*Juga chacei*)

Juga chacei is limited to spring and stream habitats that are small and cool, with coarse substrates, tributary to the Smith River and adjacent Lake Earl in Del Norte County (Taylor 1981). Although specific information on Juga chacei is not available, studies on J. silicula, a closely related stream-dwelling species found in the Coast and low Cascade ranges of Oregon (Furnish 1990) and other members of the genus to which this species belongs indicate that individuals live for several (5 to 7) years. Dispersal of individuals is typically very low.

- **Pristine springsnail** (*Pristrinicola hemphilli*)

According to Frest and Johannes (2000), *P. hemphilli* occurs mostly in very small springs and seeps, but sometimes in larger springs, spring runs or strongly spring-influenced small streams. Associated substrates are cobble to coarse gravel. Snails feed on periphyton algae attached to the substrates where they occur. Springsnails have specific and highly localized (the extent of spring run and spring-influenced areas) habitat requirements and cannot easily disperse between springs. Frest and Johannes collected 16 specimens from Del Norte County, in California, but there is not enough data to evaluate the abundance of this species. There is no published information on the population trend of this species. One known population is located at a spring along Patrick Creek.

Environmental Consequences

Proximity of Management Actions

Based on GIS analysis, the following proposed management activities are in proximity to coho habitat and have the potential to impact habitat indicators. Actions that are located farther upstream from occupied habitat have a much greater likelihood of the sediment being trapped in the stream network and would not have the potential to cause immediate impacts to coho or their habitat.

The roads in closest proximity to critical habitat and essential fish habitat proposed for decommissioning or restoration are 18N03 and 18N09.102, which are within 500 feet of critical habitat and essential fish habitat. Road 18N03 is approximately 400 feet from the upper Middle Fork Smith River and has six intermittent culverts that would be removed. Road 18N03 has a stable roadbed and is currently outsloped with no inboard ditches.

Unauthorized route 18N09.102 is approximately 300 feet from Diamond Creek and has only intermittent low-water crossings and would only require approximately one mile of outsloping and waterbarring. This route would be barricaded to prevent future use.

Alternative 1 – No Action

Based on analysis under *Water Quality*, *Soils*, and *Geology* sections, under Alternative 1 (No Action), no changes would occur. No road decommissioning (this includes decommissioning of NFTS roads) would occur on roads identified as high or moderate risk potential and therefore no reduction in road density. Any on-going road-related sediment would continue to have the potential for impacting water quality. Under this alternative, no risk mitigations including stormproofing (activities associated with improving road drainage and culvert capacity) would occur on roads identified as high or moderate risk potential to water quality. The restoration of approximately 52 miles high and moderate risk UARs would not be implemented. Sediment production from vehicle use of native surfaced routes will likely continue and hydrologically sensitive areas (route-stream crossings) will continue to be impacted. Continued use is not likely to alter peak or low stream flows because the density of these UARs is low and spread across 20 sub watersheds (6^{th}-field). It is difficult to predict where cross-country travel may occur in the future, any attempts to measure effects associated with future proliferation of routes is very speculative. Most forest visitors will stay on existing routes.

In the short term (1 year), there would be little recovery of hydrologically sensitive areas, as the UARs would still be accessible. In the long term (10 to 30 years), some passive recovery would occur in hydrologically sensitive areas, as most forest visitors would obey the rules and not intentionally use UARs, however there would be no physical barriers installed to insure unintended use would not occur.

Therefore, continued risk to coho salmon and Forest Service Sensitive aquatic species would continue and recovery plan objectives would not be met.

Effects on Aquatic Habitat Indicators

Water Quality

Water Temperature: Maintained

Riparian vegetation could potentially be disturbed during road decommissioning, culvert/bridge removal or replacement and upgrade, or stormproofing activities. Riparian trees may be cut and excavated to access each site and restore proper channel dimensions. This type of activity is likely to have no or only localized effects on stream shade and water temperature because of the small amount of vegetation being removed at any site. See the *Port-Orford-Cedar* section of this chapter for mitigations to reduce risk to this important riparian species.

Turbidity: Short-term pulses from actions, but risk reduction from restoration actions and overall reduction in turbidity.

Fine sediment introduced into a waterway can cause turbidity. An increase in turbidity can affect fish and filter-feeding macro-invertebrates downstream of the work site. At moderate levels, turbidity has the potential to adversely affect primary and secondary productivity; at higher levels, turbidity may interfere with feeding and may injure and even kill both juvenile and adult fish (Spence et al. 1996, Berg and Northcote 1985).

The proposed road decommissioning actions would generally help to limit sediment input and turbidity from road systems over time. However, activities themselves could potentially contribute some short-term sediment to streams. Fine sediment could be generated from decommissioning or culvert removal. The amount of fine sediment that could potentially enter a stream because of these activities would be minimized through the implementation of best management practices (BMPs). Where sediment does enter a stream, it is anticipated to be diluted and reduced to a discountable level that would not adversely affect listed fish and their critical habitat. This is primarily due to small intermittent streams (where activities would take place, outside of critical habitat) that are hydrologically connected to larger streams where coho salmon Critical Habitat exists. Disturbed soil will most likely be transported during the first heavy rains of winter after work has been completed. As sediment moves down these smaller streams, the amount of sediment is diluted from settling and dilution from other tributaries entering the transport stream.

When sediment finally gets into coho salmon Critical Habitat the small amount of sediment and flow from the transport tributary stream is even further diluted by entering larger streams where coho salmon may be present. Therefore, the proposed action would not result in adverse effects. Pulses of sediment and increases in turbidity would be short term and at negligible levels that would not harm or kill threatened, endangered and Sensitive fish, or adversely affect critical habitat or essential fish habitat.

As discussed in the baseline channel conditions section, the overall potential for increased turbidity levels from the action alternatives is very low and is reflective of the hard basalt geology and subsequent coarse substrate that dominates streams of the Smith River basin. The Smith River will maintain a low turbidity range that allows for a high rate of success in salmonid incubation, rearing, feeding, and spawning. Turbidity is expected to not change from the proposed action and will remain properly functioning.

Sediment: Short pulses of sediment entering stream channels, however overall sediment reduction with risk reduction from upgrades, culvert removal and decommissioning.

Increases in sediment supply beyond the transport capability of a critical habitat or essential fish habitat stream can cause stream channel instability, aggradation (sometimes to the extent that perennial streams become intermittent; Cederholm and Reid 1987), widening, loss of pools, and a reduction in gravel quality (Sullivan et al. 1987, Furniss 1991, Swanston 1991). For salmon, these changes can mean reduced spawning and rearing success when spawning areas are covered, eggs and fry suffocate or are trapped in redds, food abundance is reduced, and over-wintering habitat is reduced (Cederholm and Reid 1987, Hicks et al. 1991).

The proposed action alternatives would reduce sediment input and turbidity from road systems over time. However, the work activities themselves can contribute some short-term increases in sediment to streams. Fine sediment can be generated from culvert replacement, stabilization of storm-damaged roads, road repairs and stabilization, and removal of material from small landslides. The amount of fine sediment which could potentially enter a stream as a result of these activities will depend on the road surface type, proximity of the road to the stream, whether road ditches are connected to streams, and the density and type of vegetation and other materials between the road and the stream. The inherent standards, guidelines, and BMPs will limit the amount of fine sediment entering stream channels. Where sediment does enter a stream, it is anticipated to be diluted and reduced to a discountable level that would not adversely affect listed fish and their critical habitat. This is primarily due to small intermittent streams (where activities would take place) that are hydrologically connected to larger streams where coho salmon Critical Habitat exists. As sediment moves down these smaller streams, the amount of sediment is diluted from settling out and dilution from other tributaries. When sediment finally gets into coho salmon Critical Habitat the small amount of sediment and flow from the tributary stream is even further diluted by entering larger streams where coho salmon may be present. Therefore, the proposed action would not result in adverse effects. Pulses of sediment would be short term and would be at negligible levels that would not harm, or kill threatened, endangered and Sensitive fish, or adversely affect critical habitat or essential fish habitat.

The proposed action would address the current potential sediment yield described in the baseline discussion through road decommissioning, culvert removal/replacement, and stormproofing. Table 3-3 summarizes the net reduction of the proposed action over the project area. The amount of road-related sediment from NFS roads is expected to greatly decrease because of the proposed decommissioning (culvert removals), culvert replacements, stormproofing, and road upgrading/downgrading. All roadwork activities entailing machinery and/or ground disturbance will occur when conditions are dry; minimizing the potential for mobilized or transported sediment, and subsequent turbidity increases. These activities will disperse precipitation runoff evenly from roads and prevent runoff concentration and subsequent rills and gullies from forming.

Table 3-3. Number and type of sites treated and amount of fine sediment reduced.

Site Type	Total number of sites	Number of high priority sites	Number of medium priority sites	Fine sediment reduced (cubic yd.)
Stream Crossings (culverts and Humboldt crossings)	847	135	399	502,852
Cross Drains	924	104	140	N/A
Erosional Features	117	52	20	60,366
Totals	***1,888***	***291***	***559***	***563,218***

Restriction of motor vehicles to designated and improved NFS routes will eliminate cross-country motorized vehicle traffic, including on streambanks and gravel bars, and reduce the direct contact of vehicle tires to soil and further reduce the likelihood of any mobilization and transport of fine sediment into channels.

The proposed action alternatives would be beneficial to the sediment processes in the project area, and sediment is expected to decrease from NFS roads. National Forest System road-related sediment sources will be reduced, and the percentage of fine sediment in the substrate will remain low (less than 12 percent) and will not impede spawning success, egg incubation, and fry emergence. The proposed action would have long-term benefits to general water quality within the Smith River. However, due to the location of county and state roads along valley floors and in close proximity to the Middle and South Forks Smith River, road-related sediment will continue to be delivered to channels and the Smith River basin will continue to be at risk regarding this indicator.

Chemical Contaminants and Nutrients: Maintain

Contamination to the stream channel from the proposed activities could occur from equipment leaks (e.g., diesel fuel, oil, hydraulic fluids, and antifreezes) or spills from refueling during project implementation. However, following the inherent standards and guidelines and BMPs will reduce the risk of these hazards. Overall risk to water quality should be negligible.

Closing roads in riparian reserves that access streambanks and bars, and restricting vehicles to designated routes and parking areas, will reduce the potential for oil and gasoline (petrochemical) contamination. Upon completion of any of the proposed action alternatives, risk of contamination will decrease from NFS roads. The actions would have long-term benefits by permanently reducing the risk of water contamination and related impacts to threatened, endangered and Sensitive fish, critical habitat, and essential fish habitat. However, due to the location and extent of county and state highways adjacent to streams, this indicator will continue to be at risk.

Habitat Access

Physical Barriers: Maintain

The project will not create any new barriers to fish migration. Therefore, the watershed will continue to properly function with regard to habitat access. Anadromous salmonids will continue to be able to access the anadromous reaches of the Smith River.

Habitat Elements

Substrate: Maintain

Some sediment may enter stream channels because of heavy equipment use and disturbance of soils, particularly during road decommissioning, restoration, and culvert removal/replacements. Short-term sediment pulses in certain stream reaches may occur. However, effects are unlikely to result in decrease growth or survival of freshwater life stages of threatened, endangered and Sensitive fish. Due to the distance sediment would have to travel downstream in hydrologically connected streams, it is unlikely that enough sediment would reach coho salmon and their critical habitat to cause adverse effects.

The project will reduce fine sediment, and substrate composition will be maintained at high quality for spawning, rearing, and for benthic fauna. Therefore, the Smith River will remain properly functioning with regard to substrate.

Large Woody Debris: Maintain

Large woody debris is an important component of threatened, endangered and Sensitive fish habitat, particularly coho salmon. Large woody debris regulates sediment and flow routing, influences stream channel complexity and stability, and provides hydraulic refugia and cover within stream systems (Bisson et al. 1987, Gregory et al. 1987, Hicks et al. 1991, Sedell and Beschta 1991, Bilby and Bisson 1998). Large woody debris also plays a key role in retaining salmon carcasses (Cederholm and Peterson 1985), a major source of nitrogen and carbon in stream ecosystems (Bilby et al. 1996).

In the mainstems and lower reaches of major tributaries of the Smith River basin, large woody debris has been reduced through a variety of human activities that include past timber harvest practices and associated activities, placer and hydraulic mining activities, as well as the mandated cleanup activities that removed wood from streams throughout the region from the 1950s through the 1970s (FEMAT 1993, Bilby and Bisson 1998). The removal of trees within a distance equal to one site-potential tree height of streams (approximately 170 to 240 feet for mature conifer trees west of the Cascades, FEMAT 1993) have the potential to change the distribution, size, and abundance of large wood available for recruitment from streamside stands (Hicks et al. 1991, Ralph et al. 1994, Murphy 1995, Spence et al. 1996).

Headwater streams in the Smith River basin play an important role in watershed function. Large woody debris in headwater streams increases sediment retention by forming depositional areas and dissipating energy; retains non-woody organic matter, allowing it to be biologically processed prior to downstream export as dissolved and particulate nutrients; and delays surface water passage, allowing it to be cooled by mixing with ground water (Sullivan et al. 1987, Murphy 1995, Spence et al. 1996, Bisson and Bilby 1998). Additional wood can be recruited to fish-bearing streams from upslope and upstream areas through landslides and debris flows (McGarry 1994, Reeves et al. 1995). In some areas, wood transported in this manner may constitute up to 50 percent of the wood recruited to downstream reaches (McGarry 1994). McDade et al. (1990) could not account for 48 percent of the existing large woody debris pieces in a study of recruitment from streamside areas.

Large woody debris availability will not be altered by this project. Large woody debris will remain at risk in the Smith River. Until amounts of large woody debris sufficient to improve pool quality start to accumulate, much of the large woody debris will continue to occur above the bank full channel and potentially function during high flow periods. Juvenile and adult salmonids will continue to utilize these ephemeral habitats during winter storms as velocity refugia from potentially flushing flows. The proposed action alternatives would not affect how fish and other aquatic biota utilize large woody debris-associated habitats.

Pool Frequency: Maintain

Pool/riffle ratio (by occurrence) will not be impacted by any of the proposed action alternatives and will remain at one-third. Pool frequency will therefore continue to properly function. Pools at the current frequency and availability will continue to provide deep-water juvenile salmonid rearing habitats, feeding areas, and adult salmonid resting and holding areas.

Pool Quality: Maintain

The proposed action alternatives would not result in a change in pool quality; therefore pool quality in will remain properly functioning. As described in the previous large woody debris section, the quality of pools (e.g., amount of cover, spatial partitions, and substrate diversity) for overwintering coho salmon will likely remain as less than optimal (Meehan and Bjornn 1991).

Off-channel Habitat: Maintain

Off-channel habitat will continue to properly function and will not be impacted by this project. This type of habitat will provide early rearing areas for newly emerged juvenile salmonids as they feed, avoid predation, and grow.

Refugia: Maintain long-term improvement with overall improvement of watershed functions

The proposed action alternatives would not impact or reduce the amount or quality of properly functioning fish habitat refugia, especially in relation to critical habitat and essential fish habitat. Watersheds will function to provide habitats and resources (food, water, dissolved oxygen) for salmonids in all freshwater life stages in the event of a catastrophic habitat loss in an adjacent stream, and serve as a refugia network of critical habitat and essential fish habitat for coho and Chinook salmon throughout the Smith River basin.

Channel Conditions and Dynamics

Width to depth Ratio: Maintain

The proposed action alternatives would not impact the width/depth ratio and it will remain as properly functioning.

Streambank Condition: Maintain

Streambanks may be disturbed when culverts are removed or replaced. Streambank vegetation may be potentially removed from a site causing streambanks to be temporarily exposed to streamflow until new vegetation is reestablished. Maintenance activities may result in a loss of riparian vegetation if the road is close to the channel, which could cause some localized streambank instability. However, any resulting reduction of stability from these activities would be minor, and the effects to downstream threatened, endangered and Sensitive fish and critical habitat and essential fish habitat would be negligible.

Streambank condition will be protected from the restriction of motor vehicles to designated routes and parking areas. Therefore, streambank condition will continue to properly function.

Floodplain Condition: Maintain

The proposed action alternatives would not impact floodplain conditions. Floodplains will continue to properly function.

Flow and Hydrology

Peak and Base Flow: Maintain

The proposed action alternatives would further protect watershed processes related to natural peak/base flow (described in the baseline section), and it is expected that the peak/base flow response will continue to function properly.

Increase in Drainage Network: Improvement

The proposed action alternatives would reduce hydrologic connectivity from the road system and improve the drainage network from roads. A significant amount of routes will be decommissioned or restored and the amount of connected ditches and road related gullies will be reduced. Drainage network processes will be improved and the landscape will have a more natural drainage pattern that is closer to what existed prior to route construction.

Watershed Conditions

Road Density and Location: Improvement in sub watersheds; however, maintain at risk rating

Location of routes in relation to streams, specifically hillslope position, strongly influences how much surface and subsurface water flow a road intercepts. Mid-slope and lower slope roads in the Smith River basin can potentially intercept and re-rout flows. The proposed action would decrease runoff from maintained roads and therefore protect processes that maintain natural sediment transport efficiency and peak stream flow hydrology, and in turn protect stream channel stability. The removal of culverts, stormproofing, and improving surface drainage would restore natural hillslope drainage patterns.

The proposed action alternatives would reduce route density throughout the basin, with a portion of the reduction being near stream channels. This reduction is expected to be beneficial for downstream threatened, endangered and Sensitive fish and critical habitat and essential fish habitat by reducing the potential for road-related sediment delivery to the channel. However, due to the location of county and state roads along valley floors and in close proximity to the Middle and South Forks Smith River, road location will continue to be at risk.

Disturbance History: Improvement in sub watersheds; however, maintain at risk rating

Restoration of disturbed landscapes through NFS road decommissioning, and routes restoration, will help facilitate and augment the natural rate of watershed recovery. As route miles are reduced, forests in harvested areas mature, and mined and logged areas continue to stabilize over the long term, this indicator will begin to approach a properly functioning condition. However, due to the location of county and state roads along valley floors and in close proximity to the Middle and South Forks Smith River, road-related disturbance will continue in close proximity to channels and the Smith River basin will continue to be at risk regarding this indicator.

Riparian Reserves: Maintain

Because of their proximity and connections to streams, ecological conditions and processes in riparian areas can strongly influence threatened, endangered and Sensitive fish critical habitat and essential fish habitat. Riparian areas function to provide shade, cover, and channel structural elements; supply and process nutrients; support food webs; supply substrate materials; stabilize streambanks; filter upland sediments; and provide linkages to side channels, floodplains, and groundwater (Sullivan et al. 1987, Gregory et al. 1991, FEMAT 1993, Spence et al. 1996).

Most riparian area functions affecting streams and anadromous fish (including bank stability, shade, litterfall, large wood recruitment) occur within a distance equal to the height of a site potential tree from the edge of the streambank (FEMAT 1993, p. V-27; Spence et al. 1996, pp. 216-220) for streams without a floodplain, and decline rapidly beyond that distance. Where there is a floodplain, riparian area functions may extend for a distance equal to the height of a site-potential tree from the edge of the floodplain, since during a flood the entire floodplain can function as the stream channel (Rhodes et al. 1994).

The proposed action alternatives would further protect the processes that maintain the condition and function of riparian reserves, therefore riparian reserves will be maintained as properly functioning.

Summary of Effects of All Action Alternatives

As a result of any action alternative, some sediment may enter stream channels because of heavy equipment use and disturbance of soils during road upgrading or decommissioning. Short-term effects such as localized increases in fine sediment in certain stream reaches may occur. Fine sediment introduced into a waterway can cause turbidity. An increase in turbidity can affect fish and filter-feeding macro-invertebrates downstream of the work site. At moderate levels, turbidity has the potential to adversely affect primary and secondary productivity; at higher levels, turbidity may interfere with feeding and may injure and even kill both juvenile and adult fish (Spence et al. 1996, Berg and Northcote 1985).

Increases in sediment supply beyond the transport capability of the stream can cause stream channel instability, aggradation (where the channel can become wider and shallower and sometimes to the extent that perennial streams become intermittent) (Cederholm and Reid 1987), loss of pools, and a reduction in gravel quality (Sullivan et al. 1987, Furniss 1991, Swanston 1991). For salmon, these changes can mean reduced spawning and rearing success when spawning areas are covered, eggs and fry suffocate or are trapped in redds (*nests*), food abundance is reduced, and over-wintering habitat is reduced (Cederholm and Reid 1987, Hicks et al. 1991).

Under all alternatives, road density does not exceed three miles per square mile in any of the 5th-field watersheds, and only the Middle Fork Smith, which contains US Highway 199 and multiple Del Norte County roads, exceed two miles per square mile (2.07 miles per square mile).

Contamination to the stream channel from any of the action alternatives could occur from equipment leaks (e.g., diesel fuel, oil, hydraulic fluids, and antifreezes). However, following the Forest Plan standards of refueling at least 150 feet from a stream and having spill containment equipment on hand would reduce the risk of these hazards. Contamination may also occur from wet concrete or wastewater when bridges or culverts are repaired. Spilled wet concrete and wastewater runoff from concrete curing can cause rapid pH swings, which has the potential to kill or stress fish. However, the use of concrete would be very infrequent and be applied during low flows when many channels are dry. Therefore, any subsequent risk to water quality would be negligible. Closing roads in riparian reserves that access streambanks and bars, and restricting vehicles to designated routes, will reduce the potential for oil and gasoline (petrochemical) contamination. Upon completion of any action alternative, risk of contamination will decrease from NFS roads.

Streambanks may be disturbed when culverts are upgraded or replaced. Streambank vegetation may need to be removed from the work site causing streambanks to be temporarily exposed to streamflow until new vegetation is reestablished, which could cause some localized streambank instability. Riparian canopy vegetation would potentially be disturbed when culverts are removed and when roads are decommissioned. When culverts are removed, riparian shrubs and trees may be cut and excavated to access each site and restore proper channel dimensions. This type of activity is likely to have no or localized effects on stream shade and water temperature because of the small amount of vegetation being removed. The removal of roads adjacent to streams would have a positive effect on stream temperature and streambank stability in the long term. Trees and other riparian vegetation would re-colonize a decommissioned roadbed and, in time, help shade the adjacent stream and re-stabilize the streambanks to their natural slope.

The effects to threatened, endangered and Sensitive fish and stream habitat from any of the action alternatives is linked to degree of hydrologic connectivity—the proximity of roads to streams, specifically hillslope position, and strongly influences how much surface and subsurface water flow a road would intercept and deliver re-routed water and added road sediment to different stream segment or channel (also called a diversion). Mid-slope and lower slope roads would have the greatest potential of intercepting and re-routing flows. Increased runoff from improperly maintained roads can increase sediment transport efficiency and peak stream flows that may destabilize stream channels and reduce habitat quality. The implementation of Alternatives 5 or 6 would substantially reduce the hydrologic connectivity of the NFS road system, and restore hillslope drainage to natural patterns.

The effects of the action alternatives have been determined by the fisheries biologist to have potential short-term adverse effects, with long-term beneficial effects to threatened, endangered and Sensitive fish, coho salmon Critical Habitat, and coho and chinook salmon essential fish habitat. The NMFS concurred with this decision.

Effects of Decommissioning and Restoration on Sediment and Turbidity Indicators in Areas of Close Proximity to Coho Salmon Critical Habitat within the Middle Fork Smith River

The roads in closest proximity to critical habitat and essential fish habitat proposed for decommissioning or restoration are 18N03 and 18N09.102 and are within 500 feet of critical habitat and essential fish habitat. 18N03 is approximately 400 feet from the upper Middle Fork Smith River and has six intermittent culverts that would be removed. 18N03 has a stable roadbed and is currently outsloped with no inboard ditches. This project would be done during the summer with no flow in any of the six intermittent streams. Disturbed soils would most likely have time to settle (over summer), erosion control efforts (standards and guidelines and BMPs) would limit the amount of material that could be potentially washed into the intermittent streams that are hydrological connected. Material (sediment) that does end up in these intermittent streams would be transported downstream towards coho salmon Critical Habitat. While this material is being transported downstream, some of the material (larger size particles) will settle out in slower reaches of these streams. In addition, as streams move downhill other springs, seeps and tributaries that increase the amount of flow in them will dilute the level of sediment. When this transported material finally reaches the Middle Fork Smith River (much larger channel), the small amount of sediment and flow that would reach the river, would be quickly diluted even more from the large amount of water that it would be flowing into the Middle Fork Smith River.

Effects of Restoration on Sediment and Turbidity Indicators in Areas of Close Proximity to Coho Salmon Critical Habitat within Diamond Creek

Road 18N09.102 is approximately 300 feet from Diamond Creek and has only intermittent low water crossings and would only require approximately 1 mile of outsloping and waterbarring. Since this road already has low water crossings, little work or soil disturbance would take place in channel crossing areas. Outsloping of the road would create natural hydrological drainage and water would not get concentrated. Therefore, very little material is expected to be transported out of this area. All other roads proposed for decommissioning are more than 0.25 miles from critical habitat and essential fish habitat and would have discountable levels of turbidity and sediment reaching coho salmon and their Critical Habitat for the same reasons listed above (dilution of small amounts of sediment).

Effects Summary

Decommissioning, restoration, culvert placement and replacement, stormproofing, grading, reshaping, blading, downgrades and upgrades would result in significant long-term benefits for aquatic habitats (Furniss et al. 1991; FEMAT 1993). In total, these activities would improve hillslope drainage patterns, reduce hydrologic connectivity, and reduce road-related sediment delivery to streams. These actions however could potentially result in short-term indirect adverse effects including: 1) disturbance of stream substrates (outside of critical habitat) and downstream sediment delivery, 2) short-term loss of streambank vegetation and localized effect on stability, 3) small patches of riparian tree removal and minute losses in shade and changes in microclimate, and 4) risk of petrochemical leaks from heavy equipment. Because of the potential for short-term adverse effects, each project site would be designed, timed, and implemented according to the relevant standards, guidelines, and BMPs to minimize adverse effects to threatened, endangered and Sensitive fish species.

As sediment moves down these smaller streams, the amount of sediment is diluted from settling out and dilution from other tributaries. When sediment finally gets into coho salmon Critical Habitat the small amount of sediment and flow from the tributary stream is even further diluted by entering larger streams where coho salmon may be present. Therefore, the proposed action would not result in adverse effects. Pulses of sediment would be short term and would be at negligible levels that would not harm, or kill threatened, endangered and Sensitive fish, or adversely affect critical habitat or essential fish habitat.

All activities include the application of standards, guidelines, and BMPs to minimize the risk of project impacts, especially to minimize introduction of fine sediment into stream channels, and minimize the potential for adverse effects to threatened, endangered and sensitive fish, critical habitat, and essential fish habitat.

Table 3-4 summarizes the number and types of structures and sites treated, and the expected reduction in fine sediment sources from the proposed action alternatives.

Table 3-4. Number and type of sites proposed for treatment and resulting sediment source reduction.

Site Type	Total number of sites	High priority sites	Medium priority sites	Sites that need maintenance	Sites currently diverting	Sites with diversion potential	Fine sediment reduced (cubic yard)
Stream Crossings	847	135	399	324	47	327	502,852
Cross Drains	924	104	140	358	N/A	728	N/A
Erosional Features	117	52	20	N/A	N/A	N/A	60,366
Totals	***1,888***	***291***	***559***	***682***	***47***	***1,055***	***563,218***

Cumulative Effects

Cumulative effects are those effects of future State or private activities, not involving federal activities, which are reasonably certain to occur within the action area of the federal action subject to consultation. Future private or state activities that are reasonably certain to occur within the project area include:

- County road maintenance and bridge replacements on roads 305, 314, 315, 316, 324, 405, 411, and 427 (approximately 75 miles).
- US Highway 199 road maintenance, bridge replacements, and re-alignment (approx. 31 miles).

The amount of sediment from NFS motorized routes is expected to greatly decrease because of any of the proposed action alternatives. National Forest System route-related sediment sources will be reduced and percentage of fine sediment in the substrate will remain low (less than 12 percent) and will not impede spawning success, egg incubation, and fry emergence. However, due to the location of county and state roads along valley floors and in close proximity to the Middle and South Forks Smith River, road-related sediment will continue to be delivered to channels in areas of the Smith River basin.

Closing routes in riparian reserves that access streambanks and bars and restricting vehicles to designated routes and parking areas will reduce the potential for oil and gasoline (petrochemical) contamination. Upon completion of this proposed action, risk of contamination will decrease from NFS roads. However, due to the location and extent of county and state highways adjacent to streams, contamination will continue to be a risk.

Restoration of disturbed landscapes through decommissioning and restoration will help facilitate and augment the natural rate of watershed recovery. As road miles are reduced, forests in harvested areas mature, and mined and logged areas continue to stabilize over the long term, the legacy of effects from past activities will begin to recede. However, due to the location of county and state roads along valley floors and in close proximity to the Middle and South Forks Smith River, road-related disturbance will continue in close proximity to channels in the Smith River basin, but would not cause cumulative impacts due to the proposed action alternatives.

Aquatic Conservation Strategy Consistency

Projects must be consistent with the Aquatic Conservation Strategy objectives. Key to meeting ACS objectives is to ensure that the riparian reserves network would be maintained and restored including:

- Maintain riparian structures and functions of intermittent streams;
- Confer benefits to riparian-dependent and associated species other than fish;
- Enhance habitat conservation for organisms that are dependent on the transition zone between upslope and riparian areas; and
- Improve travel and dispersal corridors for many terrestrial animals and plants. The riparian reserves also serve as connectivity corridors among the LSRs (Forest Plan p. IV-45).

In the case of this project, no new road or motorized trail construction is proposed. Impacts to the riparian areas have occurred either through old timber sale abandoned roads, dozer lines from firefighting efforts and user created routes. All proposed action alternatives reduce or minimize the adverse effects to aquatic systems, including the prohibition of cross-country travel. For the entire project area, ACS objectives were met by minimizing motorized route additions in riparian reserves including minimizing the number of routes with stream crossings. Comparison of water quality indicators in the *Water Quality* section reveals that there is not a significant difference concerning impacts to water quality in all of the action alternatives. However, because all of the roads and routes analyzed already exist on the ground, some effects to water quality have already occurred. The main difference between all the action alternatives is the amount of UAR restoration and road decommissioning proposed. While these activities (restoration, decommissioning or designating as an ML 1 road) generally produce the same results on the ground, they are differentiated based on whether or not the travel route is already a designated system road or is currently an UAR. It is important to understand that all of these actions would prohibit motorized vehicle use.

Alternative 5 predicts the least impacts and greatest potential for water quality protection because it proposes more road decommissioning and restoration of UARs. Alternative 6 also provides for greater protection of water quality as compared to Alternatives 1 and 4. Alternative 1 (No Action) would have the most impact to water quality because it maintains the status quo and does not provide for active road restoration, decommissioning or stormproofing.

Each route proposed for addition was evaluated to ensure these routes do not prevent, and to the extent practicable contribute to, attainment of ACS objectives (Forest Plan p. IV-48). Mitigations, such as water bars, were incorporated to reduce erosion. Seasonal restrictions were also applied to address potential water quality concerns (Forest Plan p. IV-49).

Aquatic Conservation Strategy Objectives

- **Objective 1:** Maintain and restore the distribution, diversity, and complexity of watershed and landscape-scale features to ensure protection of the aquatic systems to which species, populations and communities are uniquely adapted.

  Alternatives 4, 5 and 6 contribute to a restorative effect on Objective 1 by reducing road-related impacts to the individual watersheds, by decommissioning roads, upgrading and stormproofing as well as prohibiting travel on identified UARs across the Smith River basin. Road density would be reduced in each watershed and routes not added would have drainage patterns restored and natural revegetation. The routes added to the NFTS as motorized trails would be subject to mitigations including stormproofing to reduce impacts to water quality. Seasonal gate closures reduce impacts while also protecting POC stands that have not been infected.

- **Objective 2:** Maintain and restore spatial and temporal connectivity within and between watersheds. Lateral, longitudinal, and drainage network connections include floodplains, wetlands, upslope areas, headwater tributaries, and intact refugia. These network connections must provide chemically and physically unobstructed routes to areas critical for fulfilling life history requirements of aquatic and riparian-dependent species.

  None of the alternatives change aquatic access, as there would be no significant change in flow nor are barriers created. Prohibiting cross-country travel (off road use) may prevent some further impacts to spatial and temporal connectivity caused by unauthorized travel through wetted stream channels. The majority of stream crossings are in headwater areas in ephemeral channels.

- **Objective 3:** Maintain and restore the physical integrity of the aquatic system, including shorelines, banks, and bottom configurations.

  Alternatives 4, 5 and 6 will contribute to a restorative effect on Objective 3 by restoring the physical integrity of stream channels by eliminating illegal OHV use on routes not designated. Although an exact percentage is unknown for all UARs, many of the crossings in the upper third hill slope position that were visited had no evidence of scour. Most of the route-stream crossings are characterized as ephemeral headwater order 1 and 2 streams. Of the 519 stream crossings, only 47 would be added of which 85 percent are in 1^{st} and 2^{nd} order streams. Routes not added would be barricaded and allowed to recover. The remaining route-stream crossings are characterized as intermittent orders 3 to 6 (these are typically dry in the summer months).

- **Objective 4:** Maintain and restore water quality necessary to support healthy riparian, aquatic, and wetland ecosystems. Water quality must remain within the range that maintains the biological, physical, and chemical integrity of the system and benefits survival, growth, reproduction, and migration of individuals composing aquatic and riparian communities.

  Water quality is expected to improve from pre-project conditions in all action alternatives. Maintenance of water quality would be achieved by minimizing sediment delivery to stream courses through mitigations, stormproofing to reduce diversion potential NFTS roads, restoring drainage patterns on UARs not designated and prohibiting cross-country travel. The project will contribute to maintaining the current high water quality conditions in the project area by reducing the miles of routes within riparian areas and by implementing BMPs and required mitigation measures to protect and improve water quality.

Any short-term increases in sediment production or turbidity are expected to be well within the range of what would typically occur during high winter flows or because of natural streambank erosion. At the watershed scale, changes in the overall sediment rates will not be detectable. After the completion of the proposed project, there would be a reduction in the overall road network within the drainages from current conditions. These actions would contribute to the health of the riparian, aquatic, and upland ecosystems.

- **Objective 5:** Maintain and restore the sediment regime under which aquatic ecosystems evolved. Elements of the sediment regime include the timing, volume, rate, and character of sediment input, storage, and transport.

With cross-country travel prohibited from 133 miles (Alternative 5) to 71 (Alternative 4) out of a total of 156 miles of UARs and reducing the number of stream crossings with vehicle traffic, some improvement is expected forest-wide on the load of fine sediments reaching streams. For routes designated on the NFTS, mitigations, such as waterbars, were incorporated to reduce erosion on routes identified. Seasonal restrictions were also applied where necessary to address potential water quality concerns.

The action alternatives contributes to maintaining Objective 5 at the project scale, and improving conditions at the watershed scale by helping to restore the natural sediment regime by improving road drainage on routes to be added to the NFTS and by a total decrease in road stream interactions as well as road density.

At the watershed scale, changes in the overall sediment rates will not be detectable given the high variability in natural rates of sediment input. Implementation of the mitigations would reduce high-risk routes to low risk routes in terms of water quality.

- **Objective 6:** Maintain and restore in-stream flows sufficient to create and sustain riparian, aquatic, and wetland habitats and to retain patterns of sediment, nutrient, and wood routing. The timing, magnitude, duration, and spatial distribution of peak, high, and low flows must be protected.

In many 6^{th}-field watersheds, reduction of route density in Alternatives 4, 5 and 6 may also result in changes in peak flow timing and volume, however this is likely to be undetectable as density changes are small. The action alternatives would maintain the current instream flow conditions described in Objective 6 at both the project and the watershed scales due to the age of the vegetation, the low elevation of the project area, and the small portions of the watersheds that would be affected.

- **Objective 7:** Maintain and restore the timing, variability, and duration of floodplain inundation and water table elevation in meadows and wetlands.

The project area is predominately comprised of steep narrow canyons and valley floors, where floodplains within the bankfull level are small and localized as to their influence. In the lower gradient reaches throughout the Smith River system, there is existing access to some of these small floodplains, however as part of all action alternatives, stormproofing (NFTS roads) and restoring drainage patterns (UARs) were identified on a route by route basis as needed such that the timing and variability of flows would be maintained. Duration of floodplain inundation would not be affected.

- **Objective 8:** Maintain and restore the species composition and structural diversity of plant communities in riparian areas and wetlands to provide adequate summer and winter thermal regulation, nutrient filtering, appropriate rates of surface erosion, bank erosion, and channel migration and to supply amounts and distributions of coarse woody debris sufficient to sustain physical complexity and stability.
- **Objective 9:** Maintain and restore habitat to support well-distributed populations of native plant, invertebrate and vertebrate riparian-dependent species.

  Alternatives 4, 5 and 6 all reduced the amount of routes located in riparian areas. Prohibiting use of these routes may prevent further impacts to animal and plant communities and lead to improved conditions over time as re-vegetation occurs on routes not authorized. Species composition of plant communities in riparian areas would be maintained since construction of new roads is not proposed. Mitigations for noxious weeds would reduce impacts to native plant communities.

  There are a number of roads with existing weed infestations that are proposed for addition to the NFTS. Prior to be put on the MVUM and therefore available for use, treatment would be occur so these species will not continue to spread creating new infestations into riparian areas.

Compliance with Endangered Species Act, Forest Service Sensitive Species

The FEIS, including changes from the 2007 BA, was reviewed on September 7, 2016 with NMFS during a Fish Level 1 Meeting. The 2016 FEIS proposed actions and associated 2016 *Aquatics Specialist Report* were found to be consistent with the process, activities and monitoring described in the 2015 WFRBA, and that the analysis of effects in the 2007 BA was found to be consistent with the effects analysis in the 2015 WFRBA. Therefore, §7 consultation requirements for coho salmon have been met.

This project implements recovery actions under the Final Recovery Plan for the SONCC population of coho salmon (September 2014), in that it implements important identified road-related actions of the Recovery Plan for the Smith River SONCC coho salmon Independent Population. The recovery actions identified for the Smith River Independent Population of SONCC coho salmon (Chapter 15, pp. 15-30) are as follows:

- Reduce delivery of sediment to reduce road-stream hydrologic connection in the Smith River population-wide including Smith River Plain, North, Middle, and South Forks and tributaries and Mill and Rowdy creeks; Mill Creek Road, and all areas where coho salmon would benefit immediately (SmiR.8.1.15, SmiR.8.1.67),
- Assess and prioritize road-stream connection, and identify appropriate treatments (SmiR.8.1.15.1, SmiR.8.1.67.1),
- Decommission roads, guided by assessment (SmiR.8.1.15.2 SmiR.8.1.67.2), and
- Upgrade roads, guided by assessment (SmiR.8.1.15.3, SmiR.8.1.67.3).

Determinations

Motorized routes may have unavoidable effects on streams, no matter how well they are located, designed or maintained (FEMAT 1993). Routes can affect streams directly by accelerating erosion and sediment loadings, by altering channel morphology, and by changing the runoff characteristics of watersheds (Furniss et al. 1991). Hauge et al. (1979) discussed several ways that roads can affect hillslope drainage, including changes in infiltration rates, interception and diversion of subsurface flow, changes in the watershed area of small streams, changes in the time distribution of water yield to channels, and changes in fine (micro) details of drainage. Gibbons and Salo (1973 op. cit. Furniss 1991) found that sediment contributions per unit area from roads is much greater than that from all other land management activities combined, including log skidding and yarding. In general, motorized routes have been a primary source of sediment impacts in developed watersheds (Everett et al. 1994; Rhodes et al. 1994; Wissmar et al. 1994).

The effects of any of the action alternatives are expected to not adversely affect threatened, endangered and Sensitive fish, critical habitat, and essential fish habitat and would be beneficial to threatened, endangered and Sensitive fish, critical habitat, and essential fish habitat. Individual Forest Service Sensitive species may be temporarily effected by influxes of sediment; however, it is unlikely to lead to federal listing of any of the aquatic Forest Service Sensitive species.

Botany

Introduction

Of the Forest Service regions, the Pacific Southwest Region contains the largest assemblage of sensitive plant species in comparison to its land base. Of the more than 8,000 vascular plant species occurring in California, well over half are known to occur on NFS lands. This is due to topography, geography, geology and soils, climate, and vegetation, the same factors that account for the state’s exceptionally high endemic flora.

Management of plant, lichen, bryophyte and fungi species and habitat, and maintenance of a diversity of plant communities, is an important part of the mission of the Forest Service. Management activities on NFS lands must be planned and implemented so that they do not jeopardize the continued existence of threatened or endangered species or lead to a trend toward listing or loss of viability of Forest Service sensitive species. In addition, management activities should be designed to maintain or improve habitat for rare plants and natural communities to the degree consistent with multiple-use objectives established in each Forest Plan. Key parts include: developing and implementing management practices to ensure that species do not become threatened or endangered because of Forest Service actions; maintaining viable populations of all native and desired non-native wildlife, fish, and plant species in habitats distributed throughout their geographic range on NFS lands; and developing and implementing management objectives for populations and/or habitats of rare species. The Pacific Southwest Region has over 425 rare plant species to manage.

Management decisions related to motor vehicle travel can affect plant, lichen, bryophyte and fungi species, their habitats, and natural communities. Effects include, but are not limited to, death or injury to botanical resources and habitat modification, habitat fragmentation, and habitat quality, including increased risk of weed introduction and spread, change in hydrology, increased erosion, compaction, and sediment, risk to pollinators, loss of vegetation, over-collection, or other factors reducing or eliminating plant growth and reproduction (including Trombulek and Frissell 2000). The Forest Service provides a process and standard through which rare plants, lichen, bryophyte and fungi species receive full consideration throughout the planning process, reducing negative impacts on species and enhancing opportunities for mitigation by developing and implementing management objectives for populations and/or habitats of sensitive species. It is Forest Service policy to minimize damage to soils and vegetation, avoid harassment to wildlife, and avoid significant disruption of wildlife habitat while providing for public motor vehicle use on NFS lands (FSM 2353.03(2)).

Analysis Framework: Statute, Regulation, Forest Plan, and Other Direction

Direction relevant to the proposed action as it affects botanical resources includes:

Endangered Species Act

It is Forest Service policy to analyze impacts to threatened or endangered species to ensure management activities are not likely to jeopardize the continued existence of a threatened or endangered species, or result in the destruction or adverse modification of habitat of such species that is determined to be critical. This assessment is documented in a biological assessment (BA) and is summarized or referenced in this chapter.

Executive Order 13112 Invasive Species 64 FR 6183 (February 8, 1999)

To prevent and control the introduction and spread of invasive species.

Forest Service Manual and Handbooks (FSM/H 2670)

Forest Service sensitive species are species identified by the regional forester for which population viability is a concern. It is forest service policy to analyze impacts to sensitive species to ensure management activities do not create a significant trend toward federal listing or loss of viability. This assessment is documented in a Biological Evaluation (BE) and is summarized or referenced in this chapter.

McDonalds Rockcress Recovery Plan (USDI 1984)

Summarizes current knowledge of the taxonomy, former and current distribution, and biology of the species, and presents recommendations for a program to restore it to threatened status.

Conservation Assessment for Buxbaumia viridis (DC) Moug and Nestl (USDA 2006)

Synthesizes known information about the biology, distribution, threats, management, and conservation of the species.

Conservation Assessment for Cypripedium fasciculatum and Cypripedium montanum (USDA 2005)

Addresses the biology, management and conservation of the species within California.

Conservation Assessment for Ptilidium californicum (Aust.) Underw (USDA 2006)

Synthesizes known information about the biology, distribution, threats, management, and conservation of the species.

1995 Six Rivers National Forest Land and Resource Management Plan (Forest Plan)

The Forest Plan contains the following management direction applicable to motorized travel management and botanical resources:

Sensitive Plant Species Management Goals (Forest Plan Ch.4, p.83)

Maintain the health and well-being of threatened, endangered and sensitive species and their habitats. Take all steps necessary to ensure that actions authorized, funded, or carried out by the Forest Service are not likely to jeopardize the continued existence of these species.

Standards and Guidelines

- Federally listed threatened and endangered plants and their habitats will be managed to achieve recovery plan objectives. If an approved plan is not available, all known populations and their occupied habitat will be protected from negative impacts associated with forest management activities.
- Before the NEPA process is completed, projects will be assessed through a biological evaluation to determine if management activities are likely to adversely affect sensitive plant resources. After completion of the evaluation, proposed actions will be prohibited if they are found likely to jeopardize the continued existence of the species or the maintenance of the viable populations through their existing range.
- A threshold of concern is reached for a sensitive plant species when sample populations show more than a 20 percent decline in the number of individuals over a 5-year sampling period (Forest Plan Ch. 4, V-18).

Invasive Exotic Plant Species (Forest Plan Ch.4, p.131)

Invasive exotic plant species are those that are ecologically harmful and have the ability to alter the natural or historic scene and impair the natural functioning of native plant communities.

Standards and Guidelines

- Sites for which ground-disturbing activities are planned shall be evaluated for the presence of invasive exotic plant species.
- Invasive exotic species shall be prioritized and selected for management action based on their disruptive nature, distribution and the feasibility of successful control.
- Practices that prevent the introduction or spread of invasive exotic plant species shall be incorporated into planning and analysis for all management activities that have the potential to introduce or spread these species.
- Sites treated to eradicate invasive exotic plant species shall receive follow-up monitoring.

Survey and Manage Species (Forest Plan Ch.4, pp. 84-85)

Survey and Manage (S&M) species are a standard and guideline in the Record of Decision (ROD; USDI and USDA 2001, 2003) that tiers to the NWFP. The S&M provision applies to the range of those species associated with late-successional forests. While there are S&M species within the planning area, none would be affected by the proposed actions and therefore are not analyzed further in this document.

Research Natural Areas (Forest Plan Ch.4, pp.30-31)

Research natural areas (RNAs) are part of a national network of field ecological areas designated for non-manipulative research, observation, and to study and maintain biological diversity on NFS lands. There are two RNAs on the Smith River NRA, the L.E. Horton RNA and the Craigs Creek RNA, which were established to enhance long-term ecosystem and plant research. None of the unauthorized access routes (UARs) in the proposed actions would be designated in RNAs; therefore, the areas will not be analyzed further. The UARs that traverse the L.E. Horton RNA are proposed to be restored and barricaded.

Special Interest Areas (Forest Plan Ch. 5, pp. 50-53)

These areas are set aside to manage for their unique ecological values for public use, education, and enjoyment. The goal is to promote public use, education, interpretation, and enjoyment of the special interest values of the area when such activities do not harm the values for which the area was designated. None of the UARs in the proposed actions coincide with Special Interest Areas; therefore, the areas will not be analyzed further in this document.

Effects Analysis Methodology

The analysis of direct and cumulative effects on rare botanical species (federally listed, Forest Service Sensitive, and Survey and Manage (S&M) botanical species) targets UARs being proposed as designated motorized trails on the NFTS.

Direct Effects

The effects of off road vehicle use on vegetation are considered primarily direct—immediate to longer term. The direct impacts on vegetation caused by vehicles include crushing the entire plant, its foliage, root systems, and seedlings by the wheels; uprooting; and disruption of root systems of larger plants by shear stresses induced in the soil. Root exposure and/or direct root damage may occur due to vehicle passes over vegetation, particularly in loose soils, or in wet soils susceptible to rutting, also affecting plant vigor and survival success. In addition, plant foliage and stems can be damaged and plants uprooted by the overhanging body of vehicles, so that actual plant damage may occur over an area larger than the track width. Damage to plants from vehicles can potentially lead to reductions in photosynthetic capacity and poor reproduction or death.

Indirect Effects

Indirect effects are defined as occurring 30 to 100 feet from the center of designated UARs. Dust raised by vehicle traffic, under certain conditions, can result in indirect effects. Dust coating of the foliage can disrupt critical biological processes such as photosynthesis, respiration and transpiration, thereby suppressing plant growth and vigor and in some cases altering community structure (Trombulak and Frissell 2000). Within the project area, dust accumulation has not been observed as a concern where UARs coincide with sensitive plant occurrences. Considering the low level of use and the extent of rainfall in the project area it is unlikely that dust could accumulate to an extent where it would suppress growth or vigor at a distance of 30 feet or greater from the center of UARs. Therefore, there are no indirect effects associated with dust.

Another indirect effect noted in the literature is the displacement of native plants by non-native species. Disturbance caused by OHV use can lead to the eventual replacement of native plant species with non-native species that are highly adapted to frequent disturbances and altered soil conditions, such as invasive non-native species (weeds). Many invasive species have life forms that are adapted to persist in disturbed habitats such as roadsides and areas with frequent vehicle use. Furthermore, OHVs can serve as vectors of invasive plant seed (Von Der Lippe and Kowarik 2007). However, negative impacts from non-native plant species to sensitive plant species has not been observed in association with the UARs surveyed likely due to the fact that the sensitive plant species in the project area are serpentine endemics and environmental condition of serpentine soils may have an exclusionary effect on invasive plant establishment (Harrison et. al. 2006). Therefore, there are no indirect effects to federally listed or Forest Service Sensitive plant species as a result of designating UARs to the NFTS.

Review of Best Available Science

In the first step of the analysis to the review of existing data sources were used to identify federally listed, sensitive, and S&M botanical species that are known or are believed to have potential to occur in the analysis area (FSM 2672.43). A list of federally listed species to review for the analysis was compiled using the Arcata USFWS office on-line IPaC (Information for Planning and Conservation) search page (USDI 2016). The list of sensitive botanical species was from the USDA Forest Service Region 5 Sensitive Species List (USDA Forest Service 2013).

The second step in the analysis of effects on sensitive botanical species was informed by field reconnaissance surveys conducted at the time of year when plants were evident and identifiable. Inventories of sensitive rare plants from past field surveys, monitoring, and personal field observations were utilized along with additional surveys on a subset of inventoried UARs, which includes motorized trails contained in the project, specifically in those areas where target species could be affected to determine the presence or absence of federally listed plant species, or Region 5 Forest Service sensitive plants (herein referred to as sensitive plant species). Where detected, federally listed or sensitive plants were documented by species and the number of individuals or ramets (for clonal species that produce multiple above ground stems) were tallied by occurrence—an occurrence being an aggregation of plants that are geographically separated by another aggregate by less than a quarter mile[19]. Occurrences for species analyzed in this document are commensurate with sub-populations. National Forest Transportation

[19] Occurrence definition follows the standard established by NatureServe, which defines the ranking methodology nationally for all Heritage Programs including the California Natural Diversity Database *www.wildlife.ca.gov/Data/CNDDB/Plants-and-Animals.*

System roads were not surveyed, as their highly altered, engineered surfaces are not considered suitable habitat for the target species nor are the target species known to occur on these surfaces.

Sensitive Plant Species Management Actions

Although it is likely the plant occurrences associated with motorized use of UARs have already been affected, the magnitude of human disturbances are unknown. Plants that are present on UARs, including the sensitive plants analyzed in this project, naturally occur in open settings with a relatively high percentage of bare ground. These plants have evolved with some level of natural disturbance (i.e. fire) and therefore have adapted mechanisms such as development of an underground stems called rhizomes that facilitate re-establishment after disturbance.

In light of adaptations to disturbances, these sensitive plant species have tolerated the current low level of use that has been occurring as indicated by the relatively high numbers of plants found within 30 feet of UARs, compared to numbers beyond the human disturbance distance. The higher numbers of plants within 30 feet compared to 30 to 100 feet out (7834 within 30 feet vs 3890 30 to 100 feet) is perhaps due to disturbance conditions simulated by motorized vehicle use (e.g., creation of openings for subsequent seed germination, reduced competition by other plants).

Adaptations to disturbance and disturbance tolerances are considered when determining thresholds of management concern. Reducing uncertainty over time by accruing information about a sensitive plant population provides the ability to adjust elements of the actions, from sampling frequency to thresholds of response, as new information is gained. The sensitive plant species management actions aim to detect change in sample populations relative to thresholds of concern set for individual plant species to:

1. Update baseline conditions for the four sensitive plant species that will refine, if needed, thresholds triggering management response,
2. Determine if changes in a sensitive plant occurrence are occurring within the active road prism and adjacent to the UAR by using a paired sampling approach,
3. In coordination with the line officer, identify and implement the applicable management response (e.g., barricading) to prevent a decline more than the specified allowable threshold of concern.

The monitoring methodology implemented over a 10-year period is described in detail in Appendix B.

Thresholds of Concern and Management Actions

Management response thresholds leading to management actions are identified in Table 3-5, identifying the point at which management actions are triggered to avoid a 20 percent decline (threshold of concern) in sample populations (the number of individuals) over a 5-year sampling period.

Table 3-5. Management response thresholds.

Thresholds	Opposite leaved lewisia	Serpentine Indian pink	Howells jewelflower	Western bog violet
Alt 6 Plant Totals within 30 feet of UARs	260	6,678	1,96	700
Plant numbers- triggering a management concern	26	1,002	20	105
Plant Decline – percent plant decline in relation to baseline	10%	15%	10%	15%
Alternative 6 Occurrence Totals	4	13	3	3
Occurrence decline-a decline in an occurrence with at least a good viability ranking triggering a management concern	0	0	0	0

The management response thresholds incorporate the number of plants within 30 feet of the UAR inventoried and the number of occurrences those plants represent. Additionally, professional knowledge of the respective species is factored into determining thresholds such as a species growth habit (perennial or annual, rhizomatous or not), b) its phenology (e.g., season of emergence, blooming and dormancy if applicable), or c) habitat setting and vulnerability (e.g., opposite-leaved lewisia occupies habitat of relatively gentle topography compared to Howells jewelflower which can occupy rocky slopes) in determining a given species management response threshold.

The management response threshold for direct effects is lower than the *threshold of concern* identified in the Forest Plan (USDA Forest Service 1995), in order to provide time for corrective action to occur before the threshold of concern is reached. The percentages in Table 3-5 reflect the culmination of the aforementioned factors to foreshadow when a given species' viability is a concern and when management response is needed. The opposite-leaved lewisia and Howells jewelflower, which are represented by low plant counts, have a management response threshold of 10 percent. The management response threshold for the serpentine Indian pink and the western white bog violet is 15 percent. These thresholds can change if baseline data collection reveals that population size has changed significantly since survey data was last collected for these species in 2006 and 2014.

If a management response threshold is breached due to motorized use of UARs, a concern for species viability is triggered thus warranting line office involvement and management action that includes: barricading the affected occurrence, buffering the occurrence with boulders, or having use restricted or prohibited by order of the forest supervisor (Forest Plan standard and guideline 18-24, IV-128).

Assumptions specific to botanical resources analysis

- Vehicle use has been occurring on UARs from unintended illegal motorized recreation.
- Vehicle use on UARs in the project area is currently low due to the remoteness of the project area from urban centers.
- Use will fluctuate from year to year and with increasing use, the likelihood of damage to sensitive plant species will increase. Vehicle use has affected and has the potential to affect rare plant populations either directly by damage or mortality of individual plants from motor vehicles (stem breaking, crushing, etc.).
- It is assumed that the difference in the change of a population when compared to the control population is due to the effects of the project (e.g., effects of motorized travel).

- The Sensitive Plant Species Management Actions are an essential component to preclude unacceptable effects to rare sensitive plant species directly affected by motorized use. If a management response threshold is breached due to motorized use of UARs, a concern for species viability is triggered thus warranting line office involvement and management action that includes: barricading the affected occurrence, buffering the occurrence with boulders, or having use restricted or prohibited by order of the forest supervisor (Forest Plan standard and guideline 18-24, IV-128).
- Motor vehicle use is unlikely to impact some occupied rare plant habitat that is inaccessible due to the steep or rocky nature of the surrounding terrain or where dense vegetation acts as a barrier.
- Motor vehicle use is more likely to impact sensitive rare plant occupied habitat, which exist on gentle slopes or flat terrain with little or no vegetation or natural barriers to motor vehicles.
- Without specific prevention and/or control measures, invasive non-native plants (weeds) will continue to spread along and within surfaced and unsurfaced motor vehicle roads/trails/areas. (For more detail, see the *Noxious Weed* section.)
- National Forest Transportation System roads are not considered suitable habitat for the rare plant species analyzed due to their altered engineered surfaces, nor are the target federally listed endangered or sensitive species known to occur on these surfaces.
- Direct effects effect those plants that occur within 30 feet of the center of inventoried UARs and that fall below the management response threshold. Plants and occurrences within 30 feet that fall above the management response threshold will be protected from direct effects.
- The management response threshold will trigger actions designed to prevent a loss of viability for an occurrence where an occurrence with a good or better viability rating (based on the NatureServe viability ranking methodology) is trending toward a reduction to a poor or lower rating resulting from motorized vehicle use. Therefore, there will be no direct effect to occurrence of sensitive plant species.
- There are no indirect effects. Indirect effects would be those that occur 30 to 100 feet from the center of inventoried UARs. Indirect effects, which are limited to dust accumulation and the introduction of invasive species, neither of which was observed during surveys, will not result in sensitive plant damage or mortality or the loss of an occurrence.
- Removing motorized use by barricading UARs not designated on the NFTS can benefit, federally listed endangered and sensitive plant species by protecting them from motorized use.
- Restoration of drainage patterns proposed for UARs will benefit sensitive plant species, particularly those that occur in serpentine wetland habitat or those like the opposite-leaved lewisia which grows on or adjacent to UAR 305.109A (Pine Flat Mountain) and occurs in flat depressions that are saturated in the spring. It is recommended that a botanist review the final restoration plan to insure that federally listed endangered, and Region 5 sensitive plant species benefit from and are not adversely affected by routes proposed for restoration of drainage patterns.

- Blocking non-designated trails or spurs that have received motorized use in the past that intersect the UARs will benefit Region 5 sensitive plant species that occur on or adjacent to these spurs. Of particular concern is a trail that intersects UAR 305.109 (Pine Flat Mountain) where there is a population of the Region 5 sensitive opposite-leaved lewisia growing in the intersection. It is recommended that a botanist be present when this intersection is blocked via route delineation to avoid damaging individuals of this species.
- Performing road maintenance on UARs where sensitive plant species are present has the potential to directly affect them and trigger management action. It is recommended that a botanist review road maintenance plans prior to implementation to avoid direct effects to sensitive plant species present on UARs.
- The context of a given sensitive plant's occurrence is now defined as within 100 feet of UARs. The distribution of the sensitive plant, if any, beyond this parameter of 100 feet, does not apply to the analysis of viability since no surveys were conducted beyond this distance for the project.
- Individual plant counts shown are actually stem counts (ramets). Sensitive plant species analyzed are rhizominous, multiple stems arising below.

Data Sources

- Plant nomenclature follows *The Jepson Manual Vascular Plants of California*, Second Edition (Baldwin, et al. 2012).
- Route-specific botanical data including site-specific surveys for rare species with a focus on UARs proposed to be designated on the NFTS.
- Existing sensitive plant and known sites S&M data stored in forest Microsoft Access database and in the National Resource Information System (NRIS) database.
- GIS layers of road inventories, serpentine and wetland habitats, botanical areas, RNAs, National Agricultural Imagery Program (NAIP) satellite imagery.
- Professional knowledge of species habitat and distribution on the forest to determine which species would be considered for pre-disturbance surveys.
- Route inventories collected in Step 1 of Travel Management and associated tabular data sets.
- Records from the California Natural Diversity Data Base (CNDDB) and the Consortium of California Herbaria.
- A list of federally listed species to review for the analysis was compiled using the Arcata US Fish and Wildlife Office on-line IPaC (Information for Planning and Conservation) search page (USDI 2016).

Botanical Resources Assessment of Effects by Proposed Action

Manage Botanical Resource Indicators

The following indicator measures related to actions proposed herein located in or near federally listed or Region 5 Forest Service sensitive plant locations were used to compare effects between alternatives.

- **Timeframe:** 3 to 8 years. Sensitive plants on UARs designated will be managed to determine if a threshold foreshadowing a loss of viability or trend toward federal listing is identified.
- **Spatial boundary:** Project area within 30 feet for direct effects of UARs proposed for designation to the NFTS as roads.
- **Methodology:** GIS analysis using the *Near* command in ArcMap to determine the distance of each federally listed and sensitive plant location from each UAR and road in the project area.
- **Rationale:**
    - ***Designating UARs.*** Designating UARs as motorized trails where federally listed endangered or sensitive plant species are present will likely lead to negative effects from motorized vehicles increasing mortality causing a decrease in vigor and productivity of occurrences. Direct effects to plants analyzed (those that fall under the management response threshold) will occur within 30 feet of the center of designated UARs. Alternatives with the least number of federally listed endangered or Region 5 Forest Service sensitive plant locations that fall under the management response threshold within 30 feet of designated UARs will have less direct negative effects on these rare species.
    - ***Designating Parking Sites.*** Designating parking sites where federally listed endangered or sensitive plant species are present will likely have negative effects from motorized vehicles due to damage or death to individual plants (stem breaking, crushing, etc.). Alternatives with the least number of federally listed endangered or sensitive plant species located at designated parking areas will have less negative effects on these rare species.
    - ***Decommissioning Roads.*** Federally listed endangered or sensitive species carried forward in the analysis occur on ultramafic substrate (commonly referred to as serpentine) which represents a major habitat component for species adapted to this substrate. Alternatives with the greatest acreage of decommissioned roads on serpentine habitat have the greatest beneficial effect due to the potential for habitat restoration.
    - ***Restoring Drainage Patterns.*** Restoring drainage patterns ensures that route surfaces are not channeling water increasing its erosive force causing changes in hydrology and creating erosion and sedimentation. This is beneficial to federally listed endangered or sensitive plant species growing on or adjacent to route surfaces where channeled water can undermine plants, contributing to injury and loss. Alternatives with the greatest acreage of restored drainage on serpentine habitat have the greatest beneficial effect due to the potential for habitat restoration.
    - ***Barricading UARs.*** Barricading UARs not designated as motorized trails provides a benefit to federally listed endangered and sensitive plant species by providing protection from negative vehicle effects. If low levels of use of open designated UARs should increase to a point where plants growing thereon are negatively affected, barricading UARs that are occupied will provide protection to federally listed endangered and sensitive plant species.

Because barricading raises the possibility of long-term negative effects due to the encroachment of non-rare disturbance intolerant species that are kept at bay by the low level of use, sensitive plants species that occur on barricaded routes will be inventoried periodically to determine if barricading results in negative effects to occurrences.

- ***Designating UARs as roads.*** An indicator was not used to evaluate direct effects resulting from the designation of UARs as roads to the NFTS because no federally listed endangered or Region 5 sensitive botanical species was found within 100 feet of the UARs proposed for designation as roads nor did these UARs access occurrences of these species.

Table 3-6. Type of effect by action.

Action	Type of Effect to botanical species and habitat
Designating UARs as motorized trails where federally listed endangered or sensitive plants are present within 30 feet.	Negative
Designating parking sites along 17N49 where federally listed endangered or sensitive plants are present within 30 feet.	Negative
Decommissioning where federally listed endangered or sensitive plants are present within 30 feet.	Beneficial
Restoration of drainage patterns where federally listed endangered or sensitive plants are present within 30 feet.	Beneficial
Barricading UARs not designated on the NFTS where federally listed endangered or sensitive plants are present within 30 feet.	Beneficial

1. Direct effects (within 30 feet) of the designation of UARs as motorized trails on the NFTS.

- **Indicator:** Direct effects that are detrimental are less where the number of plants and the number of occurrences of each federally listed endangered or sensitive plant species affected by designating UARs as motorized trails to the NFTS is less.
  - 1. Number of plants of federally listed endangered or sensitive plant species affected by designating UARs as motorized trails to the NFTS.

2. Direct effects (within 30 feet) of the designation of parking sites on 17N49.

- **Indicator:** Direct that are detrimental are less where the number of plants and the number of occurrences of each federally listed endangered or sensitive plants species affected by parking areas proposed for addition on 17N49 is less.
  - 2. Number of federally listed endangered or sensitive plant species affected by parking sites proposed for addition on 17N49.

3. Direct effects of the decommissioning of currently open and currently closed NFTS roads.

- **Indicator:** Effects are the more beneficial where the acreage of serpentine sensitive plant habitat for federally listed endangered or sensitive plants species is greatest. The quantity of sensitive plant habitat used as an indicator is the area 50 feet either side of roads proposed for decommissioning in serpentine habitat.
  - 3. Acres of road decommissioned in federally listed endangered or sensitive plant species serpentine habitat.

4. Direct effects (within 30 feet) of restoration of drainage patterns to inventoried UARs.

- **Indicator:** Direct effects are more beneficial where the number of acres of federally listed endangered or sensitive plant serpentine habitat proposed for restoration of drainage patterns is greatest. The quantity of sensitive plant habitat used as an indicator is the area 50 feet either side of roads proposed for restoration of drainage patterns in serpentine habitat.
    - 4. Acres of federally listed endangered or sensitive plant serpentine habitat proposed for restoration of drainage patterns.

5. Direct effects (within 30 feet) of barricading UARs.

- **Indicator:** Direct effects are more beneficial where the number of plants and the number of occurrences of each federally listed endangered or sensitive plant species protected behind barricades is greatest. Barricading routes provides beneficial effects occurring within 100 feet of inventoried UARs proposed to be barricaded.
    - 5a. Number of plants of federally listed endangered or sensitive plant species affected by barricading UARs not designated as motorized trails.
    - 5b. Number of occurrences of federally listed endangered or sensitive plant species affected by barricading UARs not designated as motorized trails.

Cumulative Effects

- **Time Frame:** The temporal context for cumulative effects for this project is the estimated at 8 to 10 years While it is assumed that project implementation may occur over a longer period, the effects of motorized use to sensitive plant species should be substantiated within the timeframes established in the *Sensitive Plant Species Management Action* section above.
- **Spatial Boundary:** The Smith River NRA is the appropriate spatial context for the analysis of cumulative effects for the *Smith River National Recreation Area Restoration and Motorized Travel Management Project*. Cumulative effects herein are associated with the federally listed endangered McDonald rockcress, and the sensitive species the Mendocino gentian, the opposite leaved lewisia, the serpentine Indian pink, Howells jewelflower, and the western bog violet. All of these species, except for the serpentine Indian pink, range from Southwestern Oregon to Northwestern California. Data on analyzed species was received from the Oregon Biodiversity Information Center in August 2013. Several gaps in this data set resulted in it not being compatible with the more complete data from Northwestern California. Oregon no longer keeps records on the opposite-leaved lewisia and lacks current data because it is not a Forest Service sensitive species in the Pacific Northwest Region, Region 6, in Oregon. Additionally, many occurrences in Oregon lack population data, data that forms an important part of this analysis. Hence, the geographic extent of this analysis is confined to the Smith River NRA, which comprises a majority of the California range of the species carried forward in the analysis.

- **Indicator(s):** Whether or not the combined effect of actions of past, present and future projects would increase the likelihood of a loss of viability or a trend toward federal listing for the rare botanical species analyzed.
- **Methodology:** Review of current and future projects to determine their combined effect on the rare botanical species analyzed.

Affected Environment

The Smith River NRA is located in the Klamath-Siskiyou Ecoregion of Northwest California and Southwest Oregon, which is recognized as an area of extraordinary biodiversity (Whittaker 1960; Kruckeberg 1984). More than 1,859 plant species, including 150 endemics are known to occur in the Klamath-Siskiyou Ecoregion (Olson et. al. 2002). Of the endemism characteristic of the Klamath-Siskiyou Ecoregion, the majority is represented within habitats associated with the Josephine ultramafic sheet that extends from Northwestern California to Southwestern Oregon. This belt of ultramafic parent material is one of the largest in North America and has the greatest concentration of endemic plant species restricted to this substrate (Kruckeberg 1984). Ultramafic parent materials, generically called serpentine, weather into soils that are high in heavy metals and low in essential nutrients. This serpentine soil chemistry along with other biological and physical factors, gave rise to distinctive plant communities that support a preponderance of rare plant species, many of which only occur on serpentine soils, resulting in their characterization as serpentine endemics. Serpentine endemics are generally confined to serpentine substrate because they require the reduced competition of harsh, open, rocky sites (Brooks 1987).

The important role serpentine plays in providing habitat to support a significant number of rare species in California is exemplified by the fact that only 1.5 percent of the State is underlain by ultramafic rock and yet 13 percent of the plant species endemic to California are serpentine endemics (Safford et. al. 2005). The Centre for Plant Diversity’s tracking of endemism notes that within the California Floristic Province the Josephine ultramafic sheet is one of the richest in endemics. In addition, serpentine settings support the highest number of plant associations described in the Klamath Province, which includes the Six Rivers and Klamath national forests (Jimerson 1995).

Plant Habitats

Habitats within the project area that support the highest number and diversity of rare plants include seasonally dry serpentine settings and serpentine wetlands. Within these habitats, there are at least 27 plants considered rare by the California Native Plant Society, eight of which are on the Region 5 Forest Service sensitive plant list, and one federally listed endangered plant species.

Seasonally dry settings include outcrops and bouldery serpentine barrens, Jeffrey pine woodlands, and shrub dominated areas. Low vegetative cover, and high bare soil and high surface rock cover characterize these habitats. Due to their ridge position, gradual slopes, and openness, some of the barren and woodland habitats are vulnerable to cross-country travel that can result in the loss of plants and vegetative material, habitat fragmentation, and potential water diversion.

Serpentine wetlands have saturated soils or running water year round. These wetland habitats are characterized by the presence of surface (perennial or intermittent) water or subsurface water in the form of spring or seep flow. Ground water flow paths, which are dependent on optimal seasonal rainfall, are important for the maintenance of saturated soil conditions upon which the serpentine wetlands and their rare species depend. Decreases in seasonal rainfall via drought or disruption of water flow paths from diversion or upslope disturbances are the greatest threat to the persistence of rare serpentine wetland species analyzed herein.

Topographically flat serpentine wetlands are known for their rare plant species, sedges, and ericaceous shrubs with a low canopy cover dominated by POC. These wetlands can be relatively extensive, for example, the L.E. Horton RNA spans approximately 40,000 square meters (1,560 acres). Serpentine wetland seeps are usually very localized sites where sub-surface water intersects the ground surface. Serpentine wetland riparian habitats for rare plants are associated with a perennial to intermittent flow of surface water across a gradient, boulder-lined stream banks with a low cover of ericaceous shrubs (western azalea being a common associate) and a moderate canopy cover dominated by POC.

Due to the array of sensitive and rare species, their habitats and diverse plant communities in the Josephine ultramafics, 21,370 acres in the North Fork Smith River watershed was established as a botanical area- the North Fork Smith Botanical Area (USDA Forest Service 1995). Botanical areas are established to protect areas of the forest with important botanical resources (36 CFR 294.1). Also associated with the Josephine ultramafics is the L.E. Horton RNA. Research natural areas are established to study and maintain biological diversity on NFS lands (FSM 4063). L.E. Horton RNA supports an extensive serpentine wetland with numerous rare and sensitive plant species.

While the serpentine soil chemistry is a primary factor influencing the botanical distinctiveness of this area, it is the heavy metals (i.e. chromium, nickel) within the parent material that has driven minerals mining and exploratory mining. As a result, the environment has been altered by development of roads, exploratory grids, mining spoil sites, mining pits and adits. The most recent exploratory mining occurred approximately 40 to 45 years ago. Mining-related disturbance is particularly evident on Gasquet Mountain.

Inventoried UARs analyzed herein have a long history of use. Current use is apparent from observations indicating fresh vehicle tracks and roadside trash, primarily on routes originating from minerals exploration. Based on knowledge resulting from botanical surveys a greater number of sensitive plant species grow on and adjacent to these routes, in spite of damage and death that can result from motorized vehicle use, as opposed to areas surveyed that are more than 30 feet beyond. Hence, it is possible that vehicle related disturbance provides some benefit under the current low level of use.

Frequent use of an area can have detrimental effects to federally listed endangered and sensitive plant species. Motorized recreation vehicles have impacted a location of the federally listed endangered McDonalds rockcress not in the project area, adjacent to County Road 305 approximately 1.5 miles before it enters Oregon. The Forest Service has attempted to mitigate impacts to the site by placing large boulders around the plants. The site is being monitored to evaluate the effectiveness of the boulders. A user created route through a serpentine wetland within the project area on Gasquet Mountain extirpated a number of individuals of the sensitive plant species, the western bog violet. This user created route is not proposed for designation to the NFTS. Although not a site within the project boundary motorized vehicles have repeatedly driven off road onto a flat open area adjacent to Forest Service Road 17N21,which has extirpated over half of the opposite leaved lewisia plants, a sensitive plant species that once occurred there.

Federally listed endangered, sensitive plant and S&M species known or thought to occur on the Smith River NRA are listed in Table 3-7.

Table 3-7. Federally listed endangered, sensitive species, and S&M species known or thought to occur on the Smith River NRA.

Scientific Name	Taxa Group	Status
Bochera koehleri	vascular plant	Sensitive
Arabis mcdonaldiana	vascular plant	Endangered
Boletus pulcherrimus	fungi	Sensitive
Buxbaumia viridis	bryophyte	Sensitive
Calicium adspersum	lichen	Sensitive
Cypripedium fasciculatum	vascular plant	Sensitive
Cypripedium montanum	vascular plant	Sensitive
Dendrocollybia racemosa	fungi	Sensitive
Draba carnosula	vascular plant	Sensitive
Epilobium oreganum	vascular plant	Sensitive
Eriogonum hirtellum	vascular plant	Sensitive
Erythronium hendersonii	vascular plant	Sensitive
Gentiana setigera	vascular plant	Sensitive
Lewisia oppositifolia	vascular plant	Sensitive
Packera hesperia	vascular plant	Sensitive
Pedicularis howellii	vascular plant	Sensitive
Phaeocollybia olivacea	fungi	Sensitive
Prosartes parvifolia	vascular plant	Sensitive
Ramalina thrausta	lichen	Sensitive
Silene serpentinicola	vascular plant	Sensitive
Sowerbyella rhenana	fungi	Sensitive
Streptanthus howellii	vascular plant	Sensitive
Tauschia howellii	vascular plant	Sensitive
Tricholomopsis fulvescens	fungi	Sensitive
Viola lanceolata	vascular plant	Sensitive

Federally Listed Endangered Species

The ESA requires that federal agencies seek information from the USFWS to determine whether any plant species listed or proposed to be listed may be present in the area of a federal action. A list of federally listed species to review for the analysis was compiled using the Arcata USFWS Office online IPaC (Information for Planning and Conservation) search page (USDI 2016) McDonalds rockcress and the western lily are the only listed plant species on the list. The western lily is a coastal species. It is not known from the project area and it is highly unlikely that it occurs therein.

Pacific Southwest Region (Region 5) Forest Service Sensitive Botanical Species

Region 5 Forest Service sensitive botanical species, herein referred to as sensitive plant species, are those eligible for listing under the ESA or whose viability is of concern. These are protected by USDA Forest

Service regulations and manual direction. The Region 5 Sensitive Plant List was updated and signed July 3, 2013 by the regional forester. This new list supersedes earlier lists and is the one used for this analysis.

Sensitive botanical species considered for this analysis are those that the proposed action potentially affects (FSM 2672.42). The following sensitive bryophyte, lichen and fungi species were not included in this analysis because critical habitat components, host trees and canopy cover will not be affected by the proposed actions. These species include *Boletus pulcherrimus, Buxbaumia viridis, Calicium adspersum, Cudonia monticola, Dendrocollybia racemosa, Fissidens pauperculus, Leptogium siskiyouensis, Mielichhoferia elongate, Otidea smithii, Peltigera gowardii, Phaeocollybia olivaceae, Ramalina thrausta, Sulcaria badia,*and *Tricholomopsis fulvescens* The following sensitive botanical species will not be affected by the proposed actions because their range does not extend onto the project area nor have botanical surveys found them to be present within the project area. These species include *Cypripedium montanum, Epilobium oreganum, Erigeron maniopotamicus, Eriogonum hirtellum, Erythronium hendersonii, Eucephalus vialis, Draba carnosula, Illiamna latibracteata, Lewisia kelloggii ssp. kelloggii, Pedicularis howellii, Sanicula tracyi,* and *Tauschia howellii*. The nearest location for *Cypripedium montanum, Lewisia kelloggii ssp. kelloggii* and *Thermopsis robusta* is over 20 miles south in Humboldt County on the Orleans Ranger District. *Epilobium oreganum, Eriogonum hirtellum, Draba carnosula, Eucephalus vialis, Illiamna latibracteata, Pedicularis howellii, Smilax jamesii* and *Tauschia howellii* are known to occur several miles east of the project area on the Siskiyou and Klamath national forests. The nearest location of *Tauschia howellii* is over four miles east near Prescott Mountain in the Siskiyou Wilderness. The closest known sites for *Lupinus constancei, Minuartia decumbens* and *Aniscocarpus scabridus* are over 80 miles south of the project area in or adjacent to the Lassics Botanical Area in Trinity County. The closest known sites for *Erigeron maniopotamicus, Frasera umquaensis, Sanicula tracyi, Sedum obtusatum ssp. paradisum* and *Streptanthus oblanceolatus* are in Trinity County, a substantial distance from the project area. The closest known site for *Bensoniella oregana* is in Humboldt county over 45 miles from the project area. *Tracyina rostrata* is not known to occur on the SRNF with known sites located south of the forest.

Federally listed Endangered and Sensitive Plant Species Identified for Further Analysis

Federally listed endangered and sensitive plant species considered in the project area that have the potential to be affected by the proposed actions are displayed in Table 3-8.

Table 3-8. Species identified for further analysis.

Common Name	Scientific Name	Status
McDonalds rockcress	*Arabis mcdonaldiana*	Federally Listed Endangered
Howells jewelflower	*Streptanthus howellii*	Region 5 Sensitive
Koehlers rockcress	*Boechera koeleri*	Region 5 Sensitive
Clustered ladys-slipper	*Cypripedium fasciculatum*	Region 5 Sensitive
Opposite-leaved lewisia	*Lewisia oppositifolia*	Region 5 Sensitive
Serpentine Indian pink	*Silene serpentinicola*	Region 5 Sensitive
Siskiyou bells	*Prosartes parvifolia*	Region 5 Sensitive
Mendocino gentian	*Gentiana setigera*	Region 5 Sensitive
Western bog violet	*Viola primulifolia ssp. occidentalis*	Region 5 Sensitive
Western ragwort	*Packera Hesperia*	Region 5 Sensitive

A total of 25.9 miles of routes were surveyed, from May 9 to June 23 2006, for those species shown in Table 3-8, except for the Siskiyou bells, which was not sensitive at the time. From April to May 2012, surveys for McDonalds rockcress were performed. A majority of the UARs surveyed are associated with old mining roads within the North Fork and main stem Smith River watersheds on the Smith River NRA and located on the Gasquet, High Divide, High Plateau, and Hiouchi 7.5 minute USGS quads. In addition to surveys of UAR surfaces, surveys were also conducted on their edges out to 100 feet on either side if suitable habitat was present.

Sensitive plant species not found to be present or not affected by the proposed action are herein removed from further analysis. These species include Koehlers rockcress, clustered ladys-slipper, Siskiyou bells, and western ragwort. The following federally listed endangered and sensitive plant species were found to be present within 30 feet of UARs. The proceeding *Methodology* section provides an explanation for how an individual plant and an occurrence was defined. Number of occurrences and number of plants are for the area of analysis. Table 3-9 displays those botanical plant species carried forward in the analysis.

Table 3-9. Species present on or within 30 feet of UARs on Smith River NRA.

Common Name	Scientific Name	Habitat
Howells jewelflower	*Streptanthus howellii*	Seasonally Dry Serpentine
Opposite-leaved lewisia	*Lewisia oppositifolia*	Seasonally Dry Serpentine
Serpentine Indian pink	*Silene serpentinicola*	Seasonally Dry Serpentine
Mendocino gentian	*Gentiana setigera*	Serpentine Wetland
Western bog violet	*Viola primulifolia ssp. occidentalis*	Serpentine Wetland

Species Accounts

McDonalds rockcress (Arabis mcdonaldiana; shown as ARMA in tables)

McDonalds rockcress (species code = ARMA) is a rare herbaceous perennial forb that is considered to be a strict serpentine endemic (Stafford 2005), only found on serpentine substrate. McDonalds rockcress is listed as *endangered*. It is typically found in very open settings on serpentine commonly referred to as serpentine barrens. Of the apparently suitable habitat within the forest, much is not occupied. Even within barrens, McDonalds rockcress individuals are found in the outcrops scattered throughout the barrens. Therefore, the distribution of plants is considered *patchy*. Where topography is not flat, a majority of the plants are located along ridge faces, which are naturally fragmented. McDonalds rockcress and its habitat are known to occur in the project area where it occupies barrens and outcrops derived from ultramafic substrate. McDonalds rockcress is confined to dry, serpentine exposures in Curry County, in Oregon and Mendocino and Del Norte County, in California. The California Native Plant Society rates it as List 1B.1 – Rare, threatened, or endangered in California and elsewhere, and seriously endangered in California. It is federally listed throughout its known range as endangered.

McDonalds rockcress has been assigned a global conservation status rank of G3 (vulnerable) at moderate risk of extinction or elimination due to a restricted range, relatively few populations (often 80 or fewer), recent and widespread declines, or other factors. Federal land management agencies (especially the Forest Service and BLM) have placed increasing emphasis on NatureServe ranks to prioritize their conservation and planning efforts.

Field reconnaissance of the project area for McDonalds rockcress first took place in 2006 and was timed to coincide with blooming season. Additional field surveys were completed in each year between 2010 and 2013. These field surveys were performed by Forest Service botanists. No plants of McDonalds rockcress were found within 30 feet of UARs. One occurrence was found within 40 feet of a UAR that is not proposed to be designated as a motorized trail. Hence, there are no direct effects to Mcdonalds rockcress.

Howells jewelflower (Strepthanthus howellii; shown as STHO in tables)

Howells jewelflower (species code = STHO) is a rare herbaceous perennial forb that is considered to be a strict serpentine endemic (Stafford 2005), only found on serpentine substrate. It is often found were large rocks and boulders provide protection and along roads surrounded by dense shrub cover. It is often observed in disturbed niches, which may be due to such factors as improved conditions for seed germination, the reduction in competition from more aggressive plant species, passive avoidance of agents of disturbance, or morphological traits that afford some protection from negative effects occurring on route surfaces. Howells jewelflower is confined to dry, brushy serpentine exposures on the Josephine ophiolite in the Siskiyou Mountains of Josephine and Curry counties, Oregon and Del Norte County in California. The California Native Plant Society rates it as List 1B.2 – Rare, threatened, or endangered in California and elsewhere. It is a Forest Service Region 5 and Region 6 sensitive species and is included on the BLM Oregon State Office Sensitive Species List.

There are 33 element occurrences[20] (henceforth referred to as occurrences) known to exist in Curry and Josephine Counties, Oregon (OHNPDB 2013). Of the occurrences known from Oregon, 10 have not been observed in over 20 years and 15 have not been observed in at least 10 years. Twelve have fewer

[20] The biologically neutral term *element occurrence*, as defined by the state Natural Heritage Program, denotes geographically distinguishable sites (within ¼ mile of each other) for rare species (NatureServe 2006).

than 12 ramets[21], 22 have a *poor* estimated viability rating, four lack population counts and five have *good* to *excellent* estimated viability in the Oregon Natural Heritage Program database.

Howells jewelflower has been assigned a global conservation status rank of G2 (Imperiled) with a high risk of extinction due to its very restricted range, very few occurrences, small number of individuals, intrinsic vulnerability, and environmental specificity. Federal land management agencies (especially the Forest Service and BLM) have placed increasing emphasis on NatureServe ranks to prioritize their conservation and planning efforts.

Survey results regarding the number of plants found either on or adjacent to the travel surface of UARs proposed for designation as motorized trails are addressed in each alternative. The above ground portion of Howells jewelflower arises from an underground tuber-like root, which can give rise to more than one above ground stem making a count of the actual number of individual plants (genets) impossible without digging each plant up. Excavation of one plant of Howells jewelflower revealed that it produced three stems from a single underground tuber. Hence, an individual plant of Howells jewelflower may produce 1 to 3 above ground shoots at a minimum. Census data displayed under each alternative records the number of shoots observed and are recorded as number of plants.

Surveys revealed that a notable percentage (98%) of Howells jewelflower plants were found within 30 feet of UARs (645 plants) compared to those found from 30 to 100 feet of UARs (10 plants). The high number of Howells jewelflower plants found on or adjacent to routes exhibiting signs of disturbance from motorized use can be attributed to several factors noted below, keeping in mind that this applies to the low level of use currently observed.

Howells jewelflower stores resources in its tuber like root system. This ability to store resources can be understood as a precaution against variability in the growing conditions of plants (Larcher 1995). Storage promotes rapid development of productive structures after inactive periods in seasonal environments and it enables plants to recover from damage in frequently disturbed habitats. The benefits of storage result from the potential to quickly rebuild parts of the plant body (leaves, stems, and roots) that are essential for future resource capture and biomass production (Suzuki and Stuefer 1999).

The ability of mature plants of Howells jewelflower to produce multiple above ground stems (ramets) can buffer plants against unfavorable consequences. The risk of plant mortality is spread among a number of stems, each capable of suffering independent mortality. If one stem out of three is crushed, a plant has greater odds of surviving than a plant with a single stem crushed to the point where photosynthesis and nutrient transport cease. Odds for survival are improved where more than one stem has to be crushed to avoid significant damage leading to loss of an individual plant. The loss of some above ground stems to crushing or grinding would set the plant back, perhaps preventing flowering the following season, but it would not necessarily lead to the loss of the individual.

A second explanation for the survival Howells jewelflower on or adjacent to the disturbed surfaces of UARs is the fact that over-wintering meristematic tissue arises from the crown of an underground root,

[21] Ramets represent the number of vegetative units or stems produced by a plant. For multi-stemmed plants that branch below ground, they represent what is visible to the observer.

which is buried under a protective layer of soil. Plant mortality depends on the amount of meristematic tissues killed (Brown et. al. 2000). The fact that this species' meristematic tissue is generated 3 to 5 inches below ground level affords some protection from direct negative effects occurring on the surface.

The low number, 2 percent, of Howells jewelflower found beyond 30 feet and up to 100 feet from UARs, the zone surveyed, suggests that Howells jewelflower is a poor competitor. In the absence of motorized disturbance on UARs, the surrounding shrub species, many with resprouting capability and greater net photosynthetic rate, would gain a size and competitive advantage. Disturbances, on the other hand, favor less competitive species and thus allow the coexistence of species with different competitive abilities. The low level of use on UARs may provide some benefit to Howells jewelflower due to the reduction in competition from species that are less tolerant of disturbance in the form of motorized use Once shrubs were cleared from the UARs and a low level of use was initiated the ability of shrubs to recolonize was compromised by slow growth rate associated with low soil fertility in the serpentine environment combined with the inherent vulnerability of above ground meristem tissue to mortality via motorized surface disturbance.

Howells jewelflower gained competitive advantage under the low level of use through its ability to store resources below ground and quickly rebuild parts of the plant body that are essential for future resource capture and biomass production. In this regard, it is more appropriate to describe Howells jewelflower as disturbance resistant rather than labeling it as disturbance tolerant. Modeling of disturbance-mediated competition between perennial plants along a resource supply gradient has predicted that selection favoring disturbance resistance is greater in species that sacrifice high maximum net photosynthetic rates in favor of increased storage than in species that sacrifice storage in favor of increased maximum net photosynthetic rates (Brewer 2011).

Opposite-leaved lewisia (Lewisia oppositifolia; shown as LEOP in tables)

Opposite-leaved lewisia (species code = LEOP) is a rare to locally uncommon herbaceous perennial forb known only from southwestern Oregon and northwestern California. It occurs in barren, gravelly to cobbly soils of serpentine origin in shallow depressions and benches that tend to remain saturated or puddled into spring. The California Native Plant Society rates it as List 2.2 – Rare, threatened, or endangered in California but more common elsewhere. It is a Forest Service Pacific Southwest Region (Region 5) sensitive botanical species. It is not on the Pacific Northwest Region's (Region 6) sensitive species list. There are at least 29 element occurrences in Curry, Jackson and Josephine Counties, Oregon according to the Oregon Natural Heritage Program (ONHP), which stopped tracking this species in 1989 when it was removed from ONHP List 4 (Vrilakas 2005). Because this species is not sensitive in Region 6, surveys are lacking and detailed data is not available for occurrences in Oregon. It has been assigned a global conservation status rank of G4; apparently secure but factors exist to cause some concern. These factors include intrinsic vulnerability and environmental specificity.

Opposite-leaved lewisia is a taprooted perennial that reproduces entirely by seed. It occurs primarily in open habitat where canopy cover is often minimal to zero, and competition from other vegetation is low. Plant blooming coincides with seasonal moisture in the spring, and usually occurs from late April to early May. In times of drought, plants remain dormant and quickly senesce following a decrease in water availability. By summer, areas with *L. oppositifolia* that were moist or saturated are dried, and the plant is no longer detectable. The root crown including the caudex (which is a thick, sometimes woody, stem of a perennial that is at or beneath the ground level) of the opposite-leaved lewisia extends about two inches below the soil surface, a depth which may afford some protection.

Survey results regarding the number of opposite-leaved lewisia found either on or adjacent to the travel surface of UARs proposed for designation as motorized trails are addressed in each alternative. Opposite-leaved lewisia initiates new spring growth from enlarged caudices, which are short almost vertical stems located at or just below ground level (Hickman 1993). Because of the shallow location of the over wintering buds it is more vulnerable to the grinding effects of tires than species like Howells jewelflower or the serpentine Indian pink which bear their over wintering buds at greater depths. Even so, 62 percent of the plants found were within 30 feet of UARs compared to 38 percent found from 30 to 100 feet of UARs. Opposite-leaved lewisia may also be prone to adverse effects from dewatering. It occurs in shallow depressions and benches that tend to remain saturated or puddled into spring. Actions that change micro-topography (e.g., wheel ruts) can dry out occupied sites and make them no longer habitable.

Serpentine Indian pink (Silene serpentinicola; shown as SISE10 in tables)

The serpentine Indian pink (species code = SISE10) is a rare herbaceous perennial forb. It is found primarily in California where it is limited to serpentine openings in Del Norte County. A population was recently found in Oregon extending about 100 meters north of the state line into Oregon along the most northern edge of the broad and flat bench known as Pine Flat Mountain (Emerson 2013). The serpentine Indian pink occurs in dry, gravelly to cobbly soils of serpentine origin on flat cross slopes. The serpentine Indian pink is a taprooted, herbaceous perennial with an underground tuber, which branches beneath the soil surface. From these branches shoots develop. Reproductive plants flower between mid-June to mid-July and may flower later into August depending on the season. Based upon field observations, it appears that flowering at a given population varies from year to year. Dormancy has been observed in other species of *Silene* (Lesica 1999). The combination of habitat (open settings, often disturbed, rocky/little herbaceous), development of underground branches that further develop above-ground shoots, the reproductive period during the summer, and possibly periods of dormancy indicate that serpentine Indian pink ecology, distribution and persistence in the landscape is associated with disturbance, likely fire.

Little is known about the biology of this species although it appears to be early successional in nature with a preference for disturbed soils found on or adjacent to roads. The serpentine Indian pinks high percentage of plants, 95 percent (9,518 plants) were found within 30 feet of UARs compared to 5 percent found from 30 to 100 feet of UARs indicating that disturbance plays a role in its persistence. It is often observed in disturbed niches, which is likely due to the same factors that are noted above for Howells jewelflower. These include poor competitive ability, meristematic tissue that is generated 3 to 5 inches below ground level, reduction in competition from species that are less tolerant of motorized disturbance, and its ability to store resources below ground and quickly rebuild parts of the plant body that are essential for future resource capture and biomass production.

The California Native Plant Society rates it as List 1B.2 – Rare, threatened, or endangered in California and elsewhere. It is a Forest Service Pacific Southwest Region (Region 5) sensitive species. It is a recently described species (Nelson and Nelson 2004). Because it is recently described, surveys are lacking and detailed information is not available for range wide occurrence data. Data provided here on number of plants is largely a result of surveys performed for the proposed action. The serpentine Indian pink has been assigned a global conservation status rank of G2 (Imperiled) with a high risk of extinction due to its very restricted range, very few known occurrences, intrinsic vulnerability, and environmental specificity.

Like Howells jewelflower, serpentine Indian pink produces an underground tuber that gives rise to one to several shoots making a count of actual plants impossible without digging all plants up. Excavation of one plant of serpentine Indian pink revealed that it produced five aboveground shoots. Hence, an individual plant may produce 1 to 5 shoots at a minimum. Census data displayed herein records the number of shoots observed and are recorded as plants. Survey results regarding the number of serpentine Indian pink plants found either on or adjacent to the travel surface of inventoried UARs proposed for designation as motorized trails are addressed in each alternative.

Mendocino gentian (Gentiana setigera; shown as GESE2 in tables)

The Mendocino gentian (species code = GESE2) is an herbaceous perennial forb that spreads by creeping rhizomes. It is known primarily from southwestern Oregon and northwestern California with one disjunct occurrence occurring on serpentines in Mendocino County. Most occurrences are relatively small. They occur in wetland habitats isolated by drier unsuitable upland habitat. It is most abundant in portions of wetlands with low shrub and tree cover, high graminoid cover, and fine-textured soils with moderate moisture content (Frost et. al. 2004). The California Native Plant Society rates it as List 1B.2 – Rare, threatened, or endangered in California and elsewhere. It has been assigned a global conservation status rank of G2 (Imperiled) with a high risk of extinction due to its very restricted range, very few known occurrences, intrinsic vulnerability, and environmental specificity. *Gentiana setigera* is more abundant in Oregon than in California where there is greater concern for its viability. There are 49 element occurrences in Curry and Josephine Counties, Oregon; 5 occurrences in Del Norte County, California; and 1 occurrence in Mendocino County, California. The five California occurrences in Del Norte County are all located on forest on the Smith River NRA and support approximately 3,321 plants. Except for one occurrence growing in a roadside ditch on 17N49.7 no plants were found on other routes proposed for designation and plants that are within 30 feet of UARs are protected by landscape features that prevent motorized access.

Western bog violet (Viola primulifolia ssp. occidentalis; shown as VIPRO2 in tables)

The western bog violet (species code = VIPRO2) is an herbaceous perennial forb that spreads by creeping rhizomes. It is associated with flowing water, steep slopes, and coarse textured soils, under open canopy conditions with high rock and soil cover (Frost et. al. 2004). It is known only from southwestern Oregon and northwestern California. The California Native Plant Society rates it as List 1B.2 - Rare, threatened, or endangered in California and elsewhere. It has been assigned a global conservation status rank of G5T2 (Imperiled) with a high risk of extinction due to its very restricted range, very few known occurrences, intrinsic vulnerability, and environmental specificity. There are 28 element occurrences in Curry and Josephine Counties, Oregon and 20 occurrences in Del Norte. All of the occurrences on the forest are within the Smith River NRA.

Like Howells jewelflower, the serpentine Indian pink, and the Mendocino gentian, the western bog violet produces an underground stem that gives rise to one to many shoots making a count of actual plants impossible without digging all plants up. For multi-stemmed plants that branch below ground, they represent what is visible to the observer. The number of stems produced by an individual plant is not known although it is considerably higher than other species noted herein and accounts for the high number of plants recorded. What is important to note is that the census data displayed herein records the number of shoots observed that are recorded as the number of individuals plants. Plants adjacent to motorized routes are protected by landscape features that prevent motorized access in all but one location that occurs in a roadside ditch along 17N49.7 near the intersection of 17N49, which is proposed for designation as a motorized trail. Although it is unlikely that vehicles would intentionally drive into the ditch, this location will be monitored.

Some of the occurrences of the Mendocino gentian and the western bog violet in the project area are proposed for designation as essential California darlingtonia wetland areas in the draft conservation strategy for five rare serpentine wetland species, which includes the Mendocino gentian and the western bog violet. Although roadside ditches and steep topography form a barrier to cross country travel through these wetlands, motorized recreation remains a threat.

Both the Mendocino gentian and the western bog violet are rhizomatous and rely on clonal growth for survival and dispersal. Clonal species vary considerably in the extent to which potentially independent offspring remain connected to parents or siblings through such structures as rhizomes and stolons. Connections may senesce rapidly or persist for many years. The presence of functional connections can affect competitive ability or determine the ability of individual shoots or modules to survive stress or injury serving as a precaution against variability in the conditions under which these plants are growing.

Environmental Consequences

Alternative 1 – No Action

Direct Effects

Under the No Action alternative, no changes would be made to the NFTS. Current management plans would continue to guide project area management. The current MVUM, published in 2009, would continue to provide the latest information on motorized use of NFTS roads and motorized trails. UARs would continue to have no status as NFTS.

An analysis of the direct effects of actions proposed under Alternative 1 (Table 3-10) follows:

1. Direct effects (within 30 feet) of the designation of UARs as motorized trails to the NFTS.

Under the No Action alternative, the negative impacts including damage or death from multiple stems breaking, crushing, etc. to federally listed endangered and sensitive plant species from motorized vehicles operating in their occupied habitat, effects are less detrimental where the number of sensitive plants and occurrences affected within 30 feet (direct) of UARs designated as motorized trails is less. Under Alternative 1, no motorized trails are designated; and therefore, there are no direct effects to federally listed endangered or sensitive plants or occurrences as a consequence of designation.

- 1. Number of plants of federally listed endangered or sensitive plant species that are potentially directly affected by designating UARs as motorized trails in Alternative 1 to the NFTS = 0 plants.

2. Direct effects (within 30 feet) of the addition of parking areas on 17N49.

The negative impacts noted therein to federally listed endangered and sensitive plant species from the construction and use of parking areas in occupied habitat the effects are less detrimental where the number of federally listed endangered or sensitive plants and occurrences occupying designated parking areas is less. No parking areas would be added under the No Action alternative; therefore, there would be no direct effect to federally listed endangered or sensitive plant species or occurrences.

- 2. Number of plants of federally listed endangered or sensitive plant species affected by designating parking at 17N49.100 under Alternative 1 = 0 plants.

3. Direct effects (within 30 feet) of the decommissioning of currently open and currently closed NFTS roads.

Serpentine environments that once served as suitable habitat for federally listed endangered or sensitive plant species analyzed herein that have been transformed into roads are no longer suitable. Roaded areas have the potential to be returned to their former state of suitable habitat through decommissioning, therefore direct effects from decommissioning are beneficial. Direct effects are the most beneficial where the decommissioned acreage of serpentine federally listed endangered or sensitive plant habitat for the species analyzed is greatest. The quantity of federally listed endangered or sensitive plant habitat used as an indicator is the area 50 feet either side of roads proposed for decommissioning in serpentine habitat. No roads are being decommissioned under Alternative 1; therefore, there are no effects.

- 3. Acres of road decommissioned affecting federally listed endangered or sensitive plant species serpentine habitat under Alternative 1 = 0 acres.

4. Direct effects (within 30 feet) of restoration of hydrological function to Inventoried UARs.

Restoring hydrologic function concerns insuring that road and route surfaces are not channeling water increasing its erosive force. This is beneficial to plants growing on or adjacent to route surfaces as channeled water can undermine plants and contribute to injury or loss. The quantity of federally listed endangered or sensitive plant habitat used as an indicator is the area 50 feet either side of roads proposed for restoring hydrologic function in serpentine habitat. Direct effects are most beneficial where the number of acres in serpentine habitat proposed for restoration of hydrological function is greatest. There is no restoration of hydrological function proposed under Alternative 1; therefore, there are no direct effects.

- 4. Acres of sensitive plant serpentine habitat proposed for restoration of hydrological function under Alternative 1 = 0 acres.

5. Direct effects (within 30 feet) of barricading inventoried UARs.

Barricading routes prevents the negative effects noted therein (damage or death from multiple stems breaking, crushing, etc.) to federally listed endangered and sensitive botanical species associated with motorized use occurring in occupied habitat. Direct effects are most beneficial where the number of acres in serpentine habitat proposed for barricading is greatest. There is no barricading of UARs proposed under Alternative 1; therefore, there are no direct effects.

- 5. Number of plants of each federally listed endangered or sensitive plant species protected from motorized use by barricading under Alternative 1 = 0.

Table 3-10. Direct effects of Alternative 1.

Indicator	Direct Effects
1. Number of plants of federally listed endangered and sensitive species potentially affected by designating UARs as motorized trails.	0
2. Number of plants of federally listed endangered and sensitive species potentially affected by designating parking sites along 17N49.	0
3. Acres of road decommissioned in federally listed endangered and sensitive species serpentine habitat.	0
4. Acres of federally listed endangered and sensitive species sensitive plant serpentine habitat proposed for restoration of drainage patterns.	0
5a. Number of plants of federally listed endangered and sensitive species potentially affected by barricading UARs not designated on the NFTS.	0
5b. Number of occurrences of federally listed endangered and sensitive species potentially affected by barricading UARs not designated on the NFTS.	0

Alternative 4

Direct Effects

An analysis of the direct effects of five actions proposed under Alternative 4 follows.

Action 1. Direct effects (within 30 feet) of the designation of UARs as motorized trails to the NFTS.

There are no direct effects to federally listed endangered plant species, as none are present within 100 feet of UARs proposed for designation as motorized trails. Effects are less detrimental where the number of sensitive plants and occurrences affected within 30 feet (direct) of UARs designated as motorized trails is less.

- 1. Number of plants of sensitive species that are potentially directly affected by designating UARs as motorized trails in Alternative 4 = 1,387 plants.

Direct effects are those that occur within 30 feet of the center of inventoried UARs proposed for designation to the NFTS and that fall below the management response threshold. The management response threshold will trigger actions designed to protect plants and occurrences from exceeding this threshold. Table 3-11 displays the number of plants and the occurrences of each of the five sensitive species within 30 feet of UARs proposed for designation to the NFTS. These species are the opposite-leaved lewisia (LEOP), the serpentine Indian pink (SISE10), Howells jewelflower (STHO), and the western bog violet (VIPRO2).

Table 3-11. Sensitive plants within 30 feet of Alternative 4 UARs designated as motorized trails.

Road_Route	Miles	OCC_ID	LEOP	SISE10	STHO	VIPRO2
17N49.100	3.88	SISE10_020		1,139		
17N49.100	3.88	STHO_014			2	
17N49.100	3.88	STHO_017			50	
17N49.101	1.17	SISE10_007		300		
17N49.101	1.17	SISE10_009		300		
17N49.102	0.87	SISE10_008		1,000		
17N49.104	3.82	SISE10_012		200		
17N49.104	3.82	SISE10_016		650		
17N49.104	3.82	SISE10_018		616		
17N49.104	0.86	STHO_017			4	
17N49.104	3.82	STHO_017			120	
17N49.107	0.64	STHO_017			2	
17N49.108	0.31	STHO_017			2	
17N49.11	1.94	SISE10_014		147		
17N49.11	2.55	SISE10_014		517		
17N49.11	1.94	STHO_017			19	
17N49.11	2.55	STHO_017			16	
17N49.11N	0.23	STHO_002			3	
17N49.12	2.1	SISE10_017		302		
17N49.12	2.1	STHO_010			76	
17N49.13	0.3	SISE10_019		45		
17N49.14	0.54	STHO_017			9	
17N49.15	0.62	STHO_017			1	
17N49.4	0.75	SISE10_006		750		
17N49.7	2.15	SISE10_013		400		
17N49.7	0.29	SISE10_015		800		
17N49.7	2.15	VIPRO2_005				500
17N49.7	2.15	VIPRO2_007				100
17N49.7	2.15	VIPRO2_008				100
17N49.7A	0.82	SISE10_017		600		
17N49.8	0.39	SISE10_016		58		
17N49.8	0.39	STHO_017			13	
18N51.100	1.45	LEOP_014	27			
305.109	2.43	LEOP_011	29			
305.109	2.43	LEOP_012	42			
305.109	2.43	LEOP_013	162			
305.109	2.43	SISE10_027		295		
305.118	0.8	STHO_039			7	
305.121B	1.03	STHO_027			6	
305.125	1.44	STHO_016			1	
305.126	1.56	STHO_009			44	
305.126	1.56	STHO_013			1	
Totals			**260**	**8,119**	**376**	**700**

Table 3-12 displays the number of plants and occurrences of each sensitive plant species within 30 feet of UARs proposed to be designated to the NFTS and the number of those sensitive plants that would be affected.

Table 3-12. Number of plants and occurrences under Alternative 4 UARs designated as motorized trails.

Alternative 4	Opposite leaved lewisia	Serpentine Indian pink	Howells jewelflower	Western bog violet
Alternative 4 plant totals within 30 feet of UARs	260	8,119	376	700
Percent plant decline in relation to baseline – management response threshold	10%	15%	10%	15%
Number of plants directly affected	26	1,218	38	105

Action 2. Direct effects (within 30 feet) of the designation of parking sites on 17N49.

The parking area proposed at the intersection of Forest Road 17N49 and UAR 17N49.100 coincides with the location of a sensitive plant species, the serpentine Indian pink. Construction of this proposed parking area would extirpate this occurrence. There are no federally listed endangered or sensitive plants species within 30 to 100 feet of the parking area. No federally listed endangered plants would be affected.

- 2. Number of plants of a sensitive species potentially affected by designating parking at 17N49.100 under Alternative 4 = 5 plants.

Action 3. Direct effects (within 30 feet) of the decommissioning of currently open and currently closed NFTS roads.

Direct effects are the most beneficial where the acreage of serpentine plant habitat for federally listed endangered or sensitive plants species is greatest. The quantity of serpentine plant habitat used as an indicator is the area 50 feet either side of roads proposed for decommissioning in serpentine habitat.

- 3. Acres of road proposed for decommissioning affecting federally listed endangered or sensitive plants species serpentine habitat under Alternative 4 = 50 acres.

Action 4. Direct effects (within 30 feet) of restoration of Hydrological Function to UARs.

Direct effects that are more beneficial where the number of acres of federally listed endangered or Sensitive plant serpentine habitat proposed for restoration of drainage patterns is greatest.

- 4. Acres of federally listed endangered and sensitive plant serpentine habitat proposed for restoration of hydrological function under Alternative 4 = 332 acres.

Action 5. Direct effects (within 30 feet) of barricading UARs.

Barricading routes provides beneficial direct effects within 100 feet of inventoried UARs proposed to be barricaded (Table 3-13).

- 5a. Number of plants of federally listed endangered and Region 5 Forest Service sensitive species potentially affected by barricading UARs not designated as motorized trails = 10,447 plants.
- 5b. Number of occurrences of federally listed endangered and Region 5 Forest Service sensitive species potentially affected by barricading UARs not designated as motorized trails = 18 occurrences.

Table 3-13. Federally listed endangered and sensitive plants within 100 feet of UARs proposed for barricading Alternative 4.

Road_Route	Miles	OCC_ID	ARMA33	GESE2	LEOP	SISE10	STHO	VIPRO2
17N07.2	0.51	LEOP_002			93			
17N49.103	0.26	SISE10_009				225		
17N49.105	1.43	GESE2_004		175				
17N49.105	1.43	SISE10_016				570		
17N49.105	1.43	SISE10_018				294		
17N49.105	1.43	STHO_017					6	
17N49.105	1.43	VIPRO2_010						7,500
17N49.105A	0.12	SISE10_016				310		
17N49.105A	0.12	STHO_017					1	
17N49.106	0.32	STHO_017					4	
17N49.7	0.29	SISE10_015				800		
305.100	0.57	STHO_024					29	
305.109A	1.02	LEOP_011			44			
305.109A	1.02	STHO_041					155	
305.115	1.74	ARMA33_039	17					
305.115	1.74	ARMA33_027	165					
305.128	0.7	STHO_037					3	
305.128	0.7	STHO_039					4	
305.131	0.09	STHO_033					52	
Total Number of Plants			**182**	**175**	**137**	**2,199**	**254**	**7,500**
Total Number of Occurrences			**2**	**1**	**2**	**5**	**7**	**1**

Table 3-14 displays the indicator values for Alternative 4.

Table 3-14. Direct effects of Alternative 4.

Indicator	Direct Effects
1. Number of plants of federally listed endangered and sensitive species potentially affected by designating UARs as motorized trails.	1,387
2. Number of plants of federally listed endangered and sensitive species potentially affected by designating parking sites along 17N49.	5
3. Acres of road decommissioned in federally listed endangered and sensitive species serpentine habitat.	50
4. Acres of federally listed endangered and sensitive species sensitive plant serpentine habitat proposed for restoration of hydrologic function.	332
5a. Number of plants of federally listed endangered and sensitive species potentially affected by barricading UARs not designated on the NFTS.	10,447
5b. Number of occurrences of federally listed endangered and sensitive species potentially affected by barricading UARs not designated on the NFTS.	18

Alternative 5

Direct Effects

An analysis of the direct effects of five actions proposed under Alternative 5 follows.

Action 1. Direct effects (within 30 feet) of the designation of UARs as motorized trails to the NFTS.

There are no occurrences of the federally listed endangered or sensitive plant species within 100 feet of inventoried UARs proposed for designation to the NFTS under Alternative 5; hence, there are no direct effects to this species.

- 1. Number of plants of federally listed endangered or sensitive plant species potentially affected by designating UARs as motorized trails to the NFTS under Alternative 5 = 0 plants.

Action 2. Direct effects (within 30 feet) of the designation of parking areas on 17N49.

Parking sites on 17N49 proposed under Alternative 5 are not near any known federally listed endangered or sensitive plant species; therefore, there are no direct effects.

- 2. Number of plants and occurrences of federally listed or sensitive plant species potentially affected by adding parking sites along 17N49 under Alternative 5 = 0 plants.

Action 3. Direct effects (within 30 feet) of the decommissioning of currently open and currently closed NFTS roads.

Direct effects are the most beneficial where the acreage of serpentine federally listed endangered and sensitive plant habitat is greatest.

- 3. Acres of road decommissioned affecting federally listed endangered and sensitive plant serpentine habitat under Alternative 5 = 144 acres.

Action 4. Direct effects (within 30 feet) of restoration of hydrological function to Inventoried UARs.

Direct effects are more beneficial where the number of acres of federally listed endangered and sensitive plant serpentine habitat proposed for restoration of hydrological function is greatest.

- 4. Acres of federally listed endangered and sensitive plant serpentine habitat proposed for restoration of hydrological function under Alternative 5 = 774 acres.

Action 5. Direct effects (within 30 feet) of barricading UARs not designated to the NFTS.

Direct effects are more beneficial where the number of plants and occurrences of each federally listed endangered and sensitive plant species is protected by barricading is greatest.

- 5. Number of plants of federally listed endangered and sensitive plant species affected by barricading UARs not designated to the NFTS under Alternative 5 = 21,515 plants.

Routes to be barricaded are shown in Table 3-15. Barricading these routes is likely to have a beneficial effect by protecting plants from detrimental effects of motorized use.

Table 3-15. Federally listed endangered and sensitive plants within 100 feet of UARs barricaded under Alternative 5.

Road_Route	Miles	OCC_ID	ARMA33	GESE2	LEOP	SISE10	STHO	VIPRO2
17N07.2	0.51	LEOP_002			93			
17N49.100	3.88	SISE10_020				1,139		
17N49.100	3.88	STHO_014					2	
17N49.100	3.88	STHO_017					50	
17N49.101	1.17	SISE10_007				300		

Road_Route	Miles	OCC_ID	ARMA33	GESE2	LEOP	SISE10	STHO	VIPRO2
17N49.101	1.17	SISE10_009				225		
17N49.102	0.87	SISE10_008				1,000		
17N49.103	0.26	SISE10_009				225		
17N49.104	3.82	SISE10_012				200		
17N49.104	3.82	SISE10_016				650		
17N49.104	3.82	SISE10_018				616		
17N49.104	0.86	STHO_003					1	
17N49.104	3.82	STHO_017					120	
17N49.104	0.86	STHO_017					5	
17N49.105	1.43	SISE10_016				570		
17N49.105	1.43	SISE10_018				294		
17N49.105	1.43	STHO_017					6	
17N49.105	1.43	VIPRO2_010						7,500
17N49.105	1.43	GESE2_004		175				
17N49.105A	0.12	SISE10_016				310		
17N49.105A	0.12	STHO_017					4	
17N49.106	0.32	STHO_017					4	
17N49.107	0.64	STHO_017					4	
17N49.108	0.31	STHO_017					4	
17N49.11	1.94	SISE10_014				147		
17N49.11	1.94	STHO_017					19	
17N49.11N	0.23	STHO_002					2	
17N49.12	2.10	SISE10_017				302		
17N49.12	2.10	STHO_010					50	
17N49.13	0.30	SISE10_019				45		
17N49.14	0.54	STHO_017					9	
17N49.15	0.62	STHO_017					1	
17N49.4	0.75	SISE10_006				750		
17N49.7	3.06	SISE10_013				400		
17N49.7	0.29	SISE10_015				800		
17N49.7	3.06	GESE2_002		250				
17N49.7	3.06	VIPRO2_005						500
17N49.7	3.06	VIPRO2_007						980
17N49.7	3.06	VIPRO2_008						2,300
17N49.7A	0.82	SISE10_017				600		
17N49.8	0.39	SISE10_016				58		
17N49.8	0.39	STHO_017					12	
18N51.100	1.45	LEOP_014			27			
305.100	0.57	STHO_024					28	
305.107	1.25	STHO_047					14	
305.109	2.43	LEOP_011			10			
305.109	2.43	LEOP_012			42			
305.109	2.43	LEOP_013			162			
305.109	2.43	SISE10_027				16		
305.109A	1.02	LEOP_011			44			
305.109A	1.02	STHO_041					155	

Road_Route	Miles	OCC_ID	ARMA33	GESE2	LEOP	SISE10	STHO	VIPRO2
305.115	1.74	ARMA33_039	17					
305.115	1.74	ARMA33_027	165					
305.118	0.8	STHO_039					7	
305.121B	1.03	STHO_027					1	
305.125	1.44	STHO_016					1	
305.126	1.56	STHO_009					44	
305.126	1.56	STHO_013					1	
305.128	0.7	STHO_037					3	
305.128	0.7	STHO_039					4	
305.131	0.09	STHO_033					52	
Total Number of Plants			**182**	**425**	**378**	**8,647**	**603**	**11,280**
Total Number of Occurrences			**2**	**2**	**5**	**11**	**14**	**4**

Table 3-16 displays the number of plants and the number of occurrences of each federally listed endangered and sensitive plant species within 30 feet of UARs not designated to the NFTS and barricaded.

Table 3-16. Number of plants and occurrences on UARs barricaded under Alternative 5.

Alternative 5	ARMA33	GESE2	LEOP	SISE10	STHO	VIPRO2	Total
Number of Plants	182	425	378	8,647	603	11,280	21,515
Number of Occurrences Affected	2	2	5	11	14	4	38

Table 3-17 displays the indicator values for Alternative 5.

Table 3-17. Direct effects of Alternative 5.

Indicator	Direct Effects
1. Number of plants of federally listed endangered and sensitive species potentially affected by designating UARs as motorized trails.	0
2. Number of plants of federally listed endangered and sensitive species potentially affected by designating parking sites along 17N49.	0
3. Acres of road decommissioned in federally listed endangered and sensitive species serpentine habitat.	144
4. Acres of federally listed endangered and sensitive species sensitive plant serpentine habitat proposed for restoration of hydrologic function.	774
5a. Number of plants of federally listed endangered and sensitive species potentially affected by barricading UARs not designated on the NFTS.	21,515
5b. Number of occurrences of federally listed endangered and sensitive species potentially affected by barricading UARs not designated on the NFTS.	38

Alternative 6

Direct effects

An analysis of the direct effects of five actions proposed under Alternative 6 follows.

Action 1. Direct effects (within 30 feet) of the designation of UARs as motorized trails to the NFTS.
Direct effects that are detrimental are less where the number of plants and the number of occurrences of each federally listed endangered and Region 5 sensitive botanical species affected by designating UARs as motorized trails to the NFTS is less. There are no occurrences of the federally listed endangered

McDonalds rockcress within 100 feet of inventoried UARs proposed for designating to the NFTS under Alternative 6; hence, there are no direct effects the species.

- 1. Number of plants of sensitive plant species potentially affected by designating UARs as motorized trails in Alternative 6 = 1,153 plants

Direct effects are those that occur within 30 feet of the center of inventoried UARs proposed for designation to the NFTS and that fall below the management response threshold. The management response threshold will trigger actions designed to protect plants and occurrences from exceeding this threshold. Table 3-18 displays, by route, the number of plants and the occurrences of each of the four sensitive plant species within 30 feet of inventoried UARs proposed for designating to the NFTS under Alternative 6. These species are the opposite-leaved lewisia (LEOP), the serpentine Indian pink (SISE10), Howells jewelflower (STHO) and the western bog violet (VIPRO2).

Table 3-18. Sensitive plants within 30 feet of Alternative 6 UARs as motorized trails.

Road_Route	Miles	OCC_ID	LEOP	SISE10	STHO	VIPRO2
17N49.101	1.17	SISE10_007		300		
17N49.101	1.17	SISE10_009		300		
17N49.102	0.87	SISE10_008		1,000		
17N49.104	3.82	SISE10_012		200		
17N49.104	3.82	SISE10_016		650		
17N49.104	3.82	SISE10_018		616		
17N49.104	3.82	STHO_017			120	
17N49.107	0.64	STHO_017			2	
17N49.108	0.31	STHO_017			2	
17N49.11	2.55	SISE10_014		517		
17N49.11	1.94	SISE10_014		147		
17N49.11	2.55	STHO_017			16	
17N49.11	1.94	STHO_017			19	
17N49.13	0.3	SISE10_019		45		
17N49.14	0.54	STHO_017			9	
17N49.15	0.62	STHO_017			1	
17N49.4	0.75	SISE10_006		750		
17N49.7	2.15	VIPRO2_005				500
17N49.7	2.15	VIPRO2_007				100
17N49.7	2.15	VIPRO2_008				100
17N49.7	2.15	SISE10_013		400		
17N49.7	0.29	SISE10_015		800		
17N49.7A	0.82	SISE10_017		600		
17N49.8	0.39	SISE10_016		58		
17N49.8	0.39	STHO_017			13	
18N51.100	1.45	LEOP_014	27			
305.109	2.43	LEOP_011	29			
305.109	2.43	LEOP_012	42			
305.109	2.43	LEOP_013	162			
305.109	2.43	SISE10_027		295		

Road_Route	Miles	OCC_ID	LEOP	SISE10	STHO	VIPRO2
305.118	0.8	STHO_039			7	
305.121B	1.03	STHO_027			6	
305.125	1.44	STHO_016			1	
Totals			**260**	**6,678**	**196**	**700**

Table 3-19 displays the number of plants and the number of occurrences of each sensitive plant species within 30 feet of UARs proposed as motorized routes.

Table 3-19. Number of plants and the number of occurrences of each sensitive plant species within 30 feet of UARs proposed as motorized routes.

Alternative 6	Opposite leaved lewisia	Serpentine Indian pink	Howells jewelflower	Western bog violet
Alternative 6 plant totals within 30 feet of UARs.	260	6,678	196	700
Percent plant decline in relation to baseline – management response threshold.	10%	15%	10%	15%
Number of plants directly affected.	26	1002	20	105
Alternative 4 Occurrence Totals	**4**	**13**	**3**	**3**

Action 2. Direct effects (within 30 feet) of the designation of parking sites on 17N49.

Parking areas on 17N49 proposed under Alternative 5 are not near any known federally listed endangered or sensitive plants or their occurrences; therefore, there are no direct effects.

- 2. Number of plants and occurrences of federally listed endangered and sensitive plant species potentially affected by adding parking areas along 17N49 under Alternative 6 = 0 plants.

Action 3. Direct effects (within 30 feet) of the decommissioning of currently open and currently closed NFTS roads.

Direct effects are the most beneficial where the acreage of serpentine sensitive plant habitat for federally listed endangered or sensitive plants species is greatest. The quantity of listed or sensitive plant habitat used as an indicator is the area 50 feet either side of roads proposed for decommissioning in serpentine habitat.

- 3. Acres of road decommissioned affecting federally listed endangered and sensitive plant serpentine habitat under Alternative 6 = 50 acres.

Action 4. Direct (within 30 feet) of restoration of hydrologic function to inventoried UARs.

Direct effects that are detrimental are less where the number of acres proposed for restoration of hydrological function is greatest.

- 4. Acres of sensitive plant serpentine habitat proposed for restoration of hydrological function under Alternative 6 = 486 acres.

Restoring hydrological function concerns insuring that route surfaces are not channeling water increasing its erosive force. This is beneficial to plants growing on or adjacent to route surfaces as channeled water can undermine plants and contribute to injury or loss.

Action 5. Direct (within 30 feet) of barricading UARs not designated to the NFTS.

Direct effects that are detrimental are less where the number of plants and occurrences of each federally listed endangered and sensitive plant species is protected by barricading is greatest.

- 5a. Potential number of plants of federally listed endangered and sensitive plant species affected by barricading UARs not designated to the NFTS under Alternative 5 = 12,256 plants.
- 5b. Number occurrences of federally listed endangered and sensitive species affected by barricading UARs not designated to the NFTS under Alternative 5 = 24 occurrences.

Routes to be barricaded are shown in Table 3-20. The total number of sensitive plants barricaded under Alternative 6 is displayed in Table 3-21. Barricading these routes would provide additional protection from the effects of motorized use.

Table 3-20. Sensitive plants barricaded under Alternative 6.

Road_Route	Miles	OCC_ID	ARMA33	GESE2	LEOP	SISE10	STHO	VIPRO2
17N07.2	0.51	LEOP_002			93			
17N49.100	3.88	ERPE6_018						
17N49.100	3.88	SISE10_020				1,139		
17N49.100	3.88	STHO_014					2	
17N49.100	3.88	STHO_017					50	
17N49.103	0.26	SISE10_009				225		
17N49.104	0.86	ERPE6_008						
17N49.104	0.86	STHO_017					5	
17N49.105	1.43	GESE2_004		175				
17N49.105	1.43	SISE10_016				570		
17N49.105	1.43	SISE10_018				294		
17N49.105	1.43	STHO_017					6	
17N49.105	1.43	VIPRO2_010						7,500
17N49.105A	0.12	SISE10_016				310		
17N49.105A	0.12	STHO_017					1	
17N49.106	0.32	STHO_017					4	
17N49.11N	0.23	STHO_002					2	
17N49.12	2.1	ERPE6_018						
17N49.12	2.1	SISE10_017				302		
17N49.12	2.1	STHO_010					50	
17N49.7	0.29	SISE10_015				800		
305.100	0.57	STHO_024					29	
305.107	1.25	ERPE6_048						
305.107	1.25	SISE10_029				200		
305.107	1.25	STHO_047					14	
305.109A	1.02	LEOP_011			44			
305.109A	1.02	STHO_041					155	
305.115	1.74	ARMA33_039	17					
305.115	1.74	ARMA33_027	165					
305.115	1.74	ERPE6_045						
305.118	0.8	ERPE6_037						

Road_Route	Miles	OCC_ID	ARMA33	GESE2	LEOP	SISE10	STHO	VIPRO2
305.126	1.56	STHO_009					44	
305.126	1.56	STHO_013					1	
305.128	0.7	ERPE6_030						
305.128	0.7	STHO_037					3	
305.128	0.7	STHO_039					4	
305.131	0.09	STHO_033					52	
Total Number of Plants			**182**	**175**	**137**	**3,840**	**422**	**7,500**
Total Number of Occurrences			**2**	**2**	**2**	**7**	**12**	**1**

Table 3-21.Total number of sensitive plants barricaded under Alternative 6.

Alternative 6	ARMA33	GESE2	LEOP	SISE10	STHO	VIPRO2	Total
Number of Plants	182	175	137	3840	422	7500	12,256
Number of Occurrences Affected	2	2	2	7	12	1	26

Table 3-22 displays the indicator values for Alternative 6.

Table 3-22. Direct effects of Alternative 6.

Indicator	Direct Effects
1. Number of plants of federally listed endangered and sensitive species potentially affected by designating UARs as motorized trails.	1,153
2. Number of plants of federally listed endangered and sensitive species potentially affected by designating parking sites along 17N49.	0
3. Acres of road decommissioned in federally listed endangered and sensitive species serpentine habitat.	50
4. Acres of federally listed endangered and sensitive species sensitive plant serpentine habitat proposed for restoration of hydrologic function.	486
5a. Number of plants of federally listed endangered and sensitive species potentially affected by barricading UARs not designated on the NFTS.	12,256
5b. Number of occurrences of federally listed endangered and sensitive species potentially affected by barricading UARs not designated on the NFTS.	26

Cumulative Effects

The cumulative effects analysis herein will not attempt to quantify the effects of past human actions by adding up all prior actions on an action-by-action basis. Focusing on individual actions would be less accurate than looking at existing conditions, because there is limited information on the environmental impacts of individual past actions, and one cannot reasonably identify every action over the last century that has contributed to current conditions. By looking at current conditions, we are likely to capture the residual effects of past human actions and natural events, regardless of which particular action or event contributed those effects. For these reasons, the analysis of past actions is based on current environmental conditions.

The cumulative effects of management activities such as timber harvesting, road building, mining, and fire suppression has resulted in many upland habitats and riparian areas with altered function and processes. However, the future options of timber harvest, road construction, and mining were largely determined through the passage of the 1990 Smith River NRA Act, as well as through designation much of the timber management zone as LSRs under the goals of the *Standards and Guidelines for Management of Habitat for Late-Successional and Old-Growth Forest Related Species Within the Range* *of the Northern Spotted Owl* (USFS/BLM 1994). The entire Smith basin is a key watershed. The Smith River NRA Act legislated management direction through eight management zones and Streamside Protection Zones. Streamside protection legislated in the Smith River NRA Act meets and, in some instances surpasses, the goals of riparian reserves in the ACS. The trend for upland and riparian habitats on the Smith River NRA is towards recovery. Since the Smith River NRA Act, timber harvest on the Smith River NRA has been geared towards restoration of late-successional characteristics and habitat development (thinning in younger stands). Furthermore, potential habitat within any project area is surveyed for sensitive plant species. If detected and it is determined that the proposed action may affect the plant or its habitat, buffers are established that preclude all activities or those that may impact the plant. For these reasons, it is anticipated that future timber harvest, road construction and mining will be substantially limited and not contribute toward cumulative effects.

An extensive cumulative effects project list was prepared for this analysis in July 2015 and appears elsewhere in the EIS. Most occurrences of federally listed and sensitive plant species analyzed herein are not affected by actions resulting from these projects. The projects associated with trail construction, relocation and maintenance, land acquisition, bridge replacement and seismic retrofit, storm damage and cable mesh drape on US Highway 101 have no effect on plants analyzed; therefore, there are no cumulative effects. Roadside fuel breaks are installed around communities to reduce wildfire risks. These areas are not considered highly suitable for federally listed or sensitive plant species. Other roadside fuel breaks occurring in potential habitat are surveyed and project design features are established to preclude or significantly reduce effects.

Projects that are designed to reduce competition by removing invasive non-native plant species serve to benefit rare species analyzed. The project, which barricaded the road to High Plateau within the North Fork Smith Special Interest Area, provides protection to occurrences of the sensitive species (the Mendocino gentian, the opposite-leaved lewisia, the serpentine Indian pink, and Howells jewelflower) which occur on High Plateau. Projects that include shaded fuel breaks, roadside sanitation, community protection and understory burns that are designed to reduce fuel accumulation also potentially benefit sensitive species affected by this project. Vegetative succession and the resultant increased cover have been identified as possible concerns (Carothers 2007) for opposite-leaved lewisia and the serpentine Indian pink in that increasing cover would change habitat suitability for the species; habitat characterized by low canopy and low shrub cover. The significance of concern over vegetation succession in ultramafic settings due to fire suppression is not straightforward. Suppression may not be as influential in ultramafic settings as it has been in forests or shrublands. In the summer and fall of 2002, the Biscuit Wildfire burned areas of the North Fork Smith River watershed on Six Rivers and in the Illinois Valley on the Siskiyou National Forest. There are no quantitative data for populations corresponding to areas of high intensity fire prior to the fire. Monitoring in 2005 indicated that known sites of opposite-leaved lewisia and the serpentine Indian pink within the fire perimeter were extant after the wildfire.

Present and future projects include implementation of *Coon Mountain Meadow Restoration* project and *Gordon Hill Vegetation Management* project. For the former, monitoring of burning effects to the opposite leaved lewisia over the past five years has not shown any negative effects to lewisia populations there. The opposite leaved-lewisia is afforded some protection from fire due to its early seed set and the fact that it occurs in area with sparse vegetation. Monitoring of project effects on the serpentine Indian pink associated with the *Gordon Hill Vegetation Management* project has not found detrimental effects. For these reasons, it is not anticipated that either the *Coon Mountain Meadow Restoration* or the *Gordon Hill Vegetation Management* project will contribute cumulative effects to the species.

For reasons noted above and with the requirements stipulated in the *Sensitive Plant Species Management Action* section above, no present or future actions are likely to result in cumulative effects that would lead to federal listing or loss of viability of the Mendocino gentian, the opposite leaved lewisia, the serpentine Indian pink, Howells jewelflower, or the western bog violet for any of the action alternatives.

Summary of Effects

Direct effects by alternative due to designating UARs to the NFTS as motorized trails.

Table 3-23 displays by alternative the number of plants and occurrences of sensitive plant species within 100 feet of UARs to be designated to the NFTS as motorized trails. The number of plants and the number of occurrences within 100 feet is used to compare effects across alternatives with the least number of plants or occurrences having the least negative effect. The higher the score the less of an impact the alternative has on botanical resources.

Table 3-23. Number of plants by species by alternative potentially affected by proposed motorized trails.

Alternative	LEOP	SISE10	STHO	VIPRO2	Total Plants	Score
Alternative 1 # of plants	0	0	0	0	0	4
Alternative 4 # of plants	26	1,218	38	105	1,387	2
Alternative 5 # of plants	0	0	0	0	0	4
Alternative 6 # of plants	26	1,002	20	105	1,153	3

Direct effects by alternative due to adding parking areas on 17N49.

Table 3-24 displays by alternative the number of plants and the number of occurrences of sensitive plant species within 100 feet of parking areas proposed to be designated along 17N49. The number of plants and the number of occurrences within 100 feet is used to compare effects across alternatives with the least number of plants or occurrences having the least negative effect. The higher the score the less of an impact the alternative has on botanical resources.

Table 3-24. Number of plants by species by alternative potentially affected by proposed parking areas.

Alternative	Total Number of Plants (SISE10) Affected	Score
Alternative 1 # of plants	0	4
Alternative 4 # of plants	5	3
Alternative 5 # of plants	0	4
Alternative 6 # of plants	0	4

Direct effects by alternative due to decommissioning of NFTS roads.

Table 3-25 displays by alternative the number of miles of suitable habitat for federally listed endangered and sensitive plant species affected by decommissioning. Direct effects are the most beneficial where the acreage of serpentine sensitive plant habitat for federally listed endangered and sensitive plant species is greatest. The quantity of sensitive plant habitat used as an indicator is the area 100 feet either side of roads proposed for decommissioning in serpentine habitat. The higher the score the less of an impact the alternative has on botanical resources.

Table 3-25. Acres of sensitive plant habitat affected by decommissioning roads.

Alternative	Acres of Sensitive Plant Habitat Affected by Decommissioning Roads	Score
Alternative 1 # acres closed	0	2
Alternative 4 # acres closed	50	3
Alternative 5 # acres closed	144	4
Alternative 6 # acres closed	50	3

Direct effects by alternative due to restoration of hydrological function to inventoried UARs.

Table 3-26 displays by alternative the acres of suitable habitat for federally listed endangered and sensitive plant species affected by the restoration of hydrological function. Direct effects are the most beneficial where the acreage of serpentine sensitive plant habitat for federally listed endangered and sensitive plant species is greatest. The quantity of sensitive plant habitat used as an indicator is the area 100 feet either side of roads proposed for restoration of hydrological function in serpentine habitat. The higher the score the less of an impact the alternative has on botanical resources.

Table 3-26. Acres of sensitive plant habitat affected by restoration of hydrological function.

Alternative	Acres of sensitive Plant Habitat Affected by Restoration of Hydrological Function	Score
Alternative 1 # acres closed	0	1
Alternative 4 # acres closed	332	2
Alternative 5 # acres closed	774	4
Alternative 6 # acres closed	486	3

Direct effects by alternative of barricading inventoried UARs.

The following tables (Table 3-27 and Table 3-28) display the number of plants and the number of occurrence of federally listed endangered and sensitive plant species protected from direct effects of motorized use by barricading. A score of four indicates that the alternative with the most plants or most occurrences affords the most protection and has the least impact on botanical resources.

Table 3-27. Number of plants by species protected by barricades.

Alternative	ARMA33	GESE2	LEOP	SISE10	STHO	VIPRO2	Totals	Score
Alternative 1 # plants	0	0	0	0	0	0	0	1
Alternative 4 # plants	182	175	137	2,199	254	7,500	10,447	2
Alternative 5 # plants	182	425	378	8,647	603	11,280	21,515	4
Alternative 6 # plants	182	175	137	3,840	422	7,500	12,256	3

Table 3-28. Number of occurrences by species protected by barricades.

Occurrences	ARMA33	GESE2	LEOP	SISE10	STHO	VIPRO2	Totals	Score
Alternative 1 # Occurrences	0	0	0	0	0	0	0	1
Alternative 4 # Occurrences	2	1	2	5	7	1	18	2
Alternative 5 # Occurrences	2	2	5	11	14	4	38	4
Alternative 6 # Occurrences	2	2	2	7	12	1	26	3

Summary of Scores for All Alternatives

Table 3-29 provides a summary comparison of the score of the five botanical resource indicators across all alternatives, with a score of 4 having the least impact to botanical resources. Alternative 5 has the least impact on botanical resources. Alternative 4 has the greatest impact.

Table 3-29. Comparison of effects to botanical resources.

Indicators – Botanical Resources	Scoring of Alternatives[22]			
	Alt 1	Alt 4	Alt 5	Alt 6
1. Score for the number of plants of federally listed endangered and Region 5 sensitive species potentially directly affected within 30 feet of UARs designated as motorized trails.	4	2	4	3
2. Score for the number of plants of federally listed endangered and sensitive plant potentially directly affected by parking areas.	4	3	4	4
3. Score for the acres of federally listed endangered and sensitive plant habitat directly affected by decommissioning.	2	3	4	3
4. Score for the acres of number of acres federally listed and sensitive plant habitat directly affected by restoration of hydrological function.	1	2	4	3
5. Score for the number of plants and occurrences of federally listed endangered and Region 5 sensitive species potentially directly affected by barricading.	1	2	4	3
Aggregate Score	**12**	**12**	**20**	**16**
Final Score	**2**	**2**	**4**	**3**

Compliance with Forest Plan and Other Direction

Determination

In all action alternatives, the federally endangered McDonalds rockcress does not occur within 100 feet of any inventoried UAR proposed for designation on the NFTS or on NFTS roads that are currently closed that are proposed for opening to motorized travel. McDonalds rockcress does occur between 30 and 100 feet of 2 inventoried UARs that are proposed to have motorized use prevented via barricades. These routes occur on serpentine barrens where vegetation encroachment is unlikely. Therefore, it is determined that actions proposed under all Action Alternatives in the *Smith River National Recreation Area Restoration and Motorized Travel Management* project will not affect McDonalds rockcress.

The Sensitive Plant Species Management Actions describe a threshold by which species persistence and/or decline can be assessed and responded to through management actions to ensure that a loss of

[22] A score of 4 indicates the alternative has the least impact for botanical resources related to the indicator. A score of 1 indicates the alternative has the most impact for botanical resources related to the indicator.

viability or trend toward federal listing for sensitive species is not resultant of the actions considered under this project. With the implementation of the Sensitive Plant Species Management Actions limiting the direct effects for sample populations before the 20 percent threshold of concern (loss of viability) is reached, it is my determination that actions proposed under all action alternatives in the *Smith River National Recreation Area Restoration and Motorized Travel Management* project may affect individuals but is not likely to result in a trend toward federal listing or loss of viability for the Mendocino gentian (*Gentiana setigera)*, the opposite-leaved lewisia (*Lewisia oppositifolia*), the serpentine Indian pink (*Silene serpentinicola*), Howells jewelflower (*Streptanthus howellii*), or the western bog violet (*Viola primulifolia* ssp. *occidentalis*).

Fire and Fuels

Introduction

Aggressive fire suppression activity across the forest over the last 80 years has resulted in fuel profiles that are outside the Historic Range of Variability, resulting in more continuous fuels, both horizontally and vertically. Given an ignition source, natural or human, resulting wildfires are becoming larger and more destructive than in the past. Substantial mortality is occurring in certain vegetation types, creating large expanses of snag patches and dead fuels.

Comparing the period's pre-and post-1950, actual fire starts have increased dramatically both for lightning and human causes since 1950. This can be explained by several factors, including increased detection efforts, increased road access, and more efficient reporting. Recent fire records show human caused fires tend to cluster along major highways, county roads, ML 3, 4 and 5 roads, and near communities and developed campgrounds. Human causes have accounted for the largest number of ignitions of wildfire for the past 37 years of fire history on the Smith River NRA; however, lightning occurs frequently throughout the forest, often with multiple ignitions from the same storm, and is responsible by far for the greatest number of acres burned for the past 37 years (Table 3-30).

Table 3-30. Fire history by acres and cause, 1978-2015.

Lightning				Human			
Acres		Frequency		Acres		Frequency	
Total	Average per Year	Total	Average per Year	Total	Average per Year	Total	Average per Year
78,932.85	2,133	156	4	3,199.95	86	367	10

Roads provide administrative access not only for accomplishing the suppression side of fire, allowing rapid response and safe deployment of firefighting resources, but also for fuels treatment to prevent catastrophic fire. Each alternative in the project was analyzed for its ability to provide access for fire suppression and fuels management using the identified high fire priority road system under this analysis.

Analysis Framework: Statute, Regulation, Forest Plan and Other Direction

Direction relevant to the proposed action as it affects fire and fuels include:

1995 Six Rivers National Forest Land and Resource Management Plan (Forest Plan)

The Forest Plan identifies the following standards and guidelines applicable to fire and fuels management (Table 3-31), which are applied to all alternatives and will be considered during the analysis process:

Table 3-31. Forest Plan standards and guidelines for fire and fuels.

Topic	Number	Forest Plan Standard and Guideline
Management Area 17 – General Forest	IV-63	Wildfires will be suppressed. Management related fuels will be treated so as to be consistent with wildlife habitat needs as described in forest-wide standards and guidelines.
Fire and Fuels Management/Chapter 4	IV-117 14-1	All wildfires will receive a suppression response that is appropriate to meet the management area objectives. The response will be safe, timely, and cost efficient.
	IV-117 14-2	When properly equipped Forest Service engines and trained personnel are available, they will take fire suppression action to protect structures within the forest's area of responsibility for all reported fires that involve a threat to life or pose a threat to national forest resources.
	IV-117 14-3	Concentrations of fuels created by management activities will be reduced to acceptable levels and arrangements based on the site-specific wildfire risk and the needs of other resources. The selected treatment methods should consider resource values and environmental limitations (e.g., topography, accessibility) as well as costs.
	IV-117 14-4	Prescribed fire will be used in natural fuels treatment for various benefits including: a) enhancement of diversity in the structure and composition of plant communities; b) reduction of fire hazard; c) area enhancement for the production and protection of commercial timber yields; d) enhancement of the production of plants and other materials for Native American gathering; and e) enhancement of other resource outputs such as wildlife habitat, forage, and browse.
	IV-117 14-5	When prescriptions for timber, wildlife, and other resource management projects call for burning as a method of accomplishment, the risk of fire damage to adjacent resource and property values will be evaluated and plans developed to minimize negative impacts.
	IV-117 14-6	Naturally ignited fires may be managed as prescribed fires, as determined on a case-by-case basis through an assessment of hazard and risk and the direction found in the area specific fire management plan.
	IV-117 14-7	Structural components such as snags, duff, and coarse woody debris should be protected from wildfire and suppression damage to the extent possible. Trees and snags should be felled only if they pose a threat to firefighter safety or contribute to the risk of wildfire spread.
	IV-117 14-8	Those suppression actions likely to cause more damage to critical resources (e.g., threatened and endangered plant or animal species, and their habitats) than the fire itself will be carefully evaluated and alternative actions considered. Resource management experts will be involved to evaluate potential suppression damage compared to potential wildfire damage.
	IV-117 14-9	Appropriate resource management experts will be included in developing project level hazard reduction plans. These plans should identify levels of coarse woody debris and snags (of adequate size and in sufficient amounts) to meet the habitat requirements of species of concern. Additionally, these plans must provide for the safety of firefighting personnel and produce a fuel profile that supports land allocation objectives.
	IV-117 14-10	Resource management activities should be designed and implemented so that the wildfire hazard level of the surrounding area is not increased to an unacceptable level.
	IV-117 14-11	For areas in the matrix that are located in the rural interface, fire management activities should be coordinated with local governments, agencies, and landowners during watershed analysis to identify additional factors which may affect hazard reduction goals. Hazard reduction may become more important in the rural interface and areas adjacent to structures, dwellings or other amenities. (FSEIS ROD p. C-48)

Forest Plan Forest-wide Desired Conditions

The forest-wide desired future condition (DFC) is described on pages IV-2 through IV-4 in the Forest Plan. The project area is represented by Management Area 7 (p. IV-34):

Management Area 7 – Smith River NRA

The Smith River NRA was established in November of 1990, by SB 2566/HB4309. The Smith River NRA is managed under direction provided by eight management areas. The primary goals are to emphasize, protect, and enhance the unique biological diversity; anadromous fisheries; and the wild, scenic, and recreational potential of the Smith River while providing sustained yields of forest products. See Smith River NRA Plan (Forest Plan Appendix A 1995).

Goal

Provide well-planned and well-executed fire protection and fuel management programs (including fire use through prescribed burning) that are responsive to land and resource management objectives.

Direction

Fire is a fundamentally important ecological process in most grassland, shrubland, and forest types in California. In fire-adapted ecosystems, fire regulates biotic productivity and stability in ways that cannot be fully emulated by mechanical or chemical means. In the prolonged absence of fire, and aggravated by other disturbance factors, these fire-adapted forests and grasslands have undergone significant changes in species composition and structure. Intermediate canopy layers and higher ground fuel loadings have developed which allow ground fires to reach the crown more easily, making fires more difficult to control. Often more apparent during prolonged periods of drought, these changes have predisposed extensive areas to epidemic insect infestations, disease outbreaks, and severe stand replacing wildfires. Also, the growing urban/wildland intermix requires adjustments in strategies to protect life and property.

A programmatic diversity will be maintained in fire management, but efforts in prevention, suppression, hazard reduction, and fire rehabilitation will be aligned to more fully complement one another in support of ecosystem management.

Application of prescribed fire for ecosystem maintenance and restoration, and for hazard reduction should vary in extent and frequency of application, and intensity of burning. The differences in applications should be related to the role of natural fire in specific landscapes, current ecosystem needs, and wildfire hazard analysis included in fire management planning efforts.

36 CFR 261.13 – Motor-vehicle use

The emergency response closure exemption, found in 36 CFR 261.13 that states “After NFS roads, NFS trails, and areas on NFS lands have been designated pursuant to 36 CFR 212.51 on an administrative unit or a Ranger District of the NFS, and these designations have been identified on a MVUM, it is prohibited to possess or operate a motor vehicle on NFS lands in that administrative unit or Ranger District other than in accordance with those designations, provided that the following vehicles and uses are exempted from this prohibition: (e) Use of any fire, military, emergency, or law enforcement vehicle for emergency purposes.”

Other Documents

In 2005, the Del Norte County Fire Safe Council completed a Community Wildfire Protection Plan (CWPP). The CWPP identifies and prioritizes projects to reduce wildfire risk through fuel hazard reduction, community education, and pre-fire suppression in Del Norte County. The CWPP was developed using a collaborative process involving local, tribal, state, and federal government agencies, fire protection districts, landowners, and interested publics. The CWPP identified risks and mitigations to reduce risks from wildfire in Del Norte County. Nine community meetings were held throughout the county to determine what the local fire safety issues were and to prioritize projects for agency and community action.

Effects Analysis Methodology

Assumptions Specific to the Fire and Fuels Analysis

- The criteria used to identify roads that provide necessary access for fire suppression activities and fuel treatment areas are found in the Smith River RAP.
- No major ridge top or main access roads (ML 3, 4, or 5) on the NFTS roads are proposed to be decommissioned from the NFTS, or downgraded to ML 1 in this project.
- Each road was given a high, medium, or low rating for one or more of the evaluation criteria. An overall rating was based upon the answers and staff knowledge of the District’s current and future fire suppression and fuels treatment programs.
- Each alternative in the project was analyzed for its ability to provide access for fire suppression and fuels management using the identified high fire need road system under this analysis (ML 1, 2, and UARs). Approximately 207 miles have been identified as high fire need roads/routes.
- The results of the analysis show the high priority fire roads and UARs proposed to be downgraded, decommissioned, or restored (UARs), and designated or upgraded on the NFTS.
- Maintenance Level 2 roads are important roads for fire access and make up the majority of roads identified in the high priority fire needs.
- Maintenance Level 1 roads are closed to vehicle use year-round, and are generally roads that currently have limited feasible fire access due to road failures, vegetation encroachment, or other resource/access issues. Therefore, these roads would need improvements to meet accessibility needs for fire or fuels management.
- Miles of road downgraded to ML 1 are analyzed in this proposal as a loss in access.
- Motorized trails could need improvements to meet accessibility needs for fire or fuels management.
- Roads do create access that could increase human caused fires, but roads also decrease initial attack response times.

Data Sources

Forest-level GIS/spatial data sources used for this analysis are listed in Table 3-32.

Table 3-32. Spatial data used for the analysis and a brief description of each data set.

Layer Name	Description
SRF_Fire History2010-Layer	Smith River NRA Fire History
WUI_Srf_hoopa_uk-Layer Srf_Library_NRA.DBO.CommunitiesAtRisk	WUIs and Communities at high risk of wildland fire
RickNeed_join_PA_with_UAR_NewBoundary_732013-Table Layer	Fire and fuels administrative needs
BasicOwnership	Private land ownership
SRNRA_Fuels_Treatments	Current and future fuels treatment areas
Watersources_SRF	Water sources used for fire suppression efforts

Site-specific personal knowledge of agency fire and fuels specialist was used where forest-level data were not current or not available.

Indicator

- Total miles by alternative to be designated or maintained on the NFTS as ML 1, 2, or UARs as the high fire priority roads system.

Affected Environment

Wildfires have contributed dramatically to the vegetative makeup of the Smith River basin. Historical records, fire evidence, and studies in adjacent areas show that fires regularly occurred in this area with a variety of fire frequencies and intensities. A certain degree of stand replacing, high intensity fires were a natural part of the Smith River NRA fire regime. Pre-settlement wildfires that were often large, stand replacing events, whose smoke could be seen far out to sea. Both wildfires and their exclusion through aggressive suppression affect plant and animal habitat, including stand structure, number of standing snags, amount of large woody debris, soil organic matter content, nutrient availability, and erosion hazard.

The dramatic reduction in wildfire burn acreages over the last 80 years appears to have resulted in non-historic range of variability fuel profiles that are more continuous, both horizontally and vertically. Given this increased conifer density, future wildfires could become larger and more destructive than in the past.

In the prolonged absence of fire, and aggravated by other disturbance factors, these fire-adapted forests and grasslands have undergone significant changes in species composition and structure. Intermediate canopy layers and higher ground fuel loadings have developed which allow ground fires to reach the crown more easily, making fires more difficult to control.

This fire frequency suggests developmental pathways for stand structures which are in marked contrast to the development of old growth/late seral Douglas-fir forests farther north (Oregon Cascades or coast). These differences carry important implications for patterns of regeneration, coarse woody debris accumulations, stand structure, species composition, as well as historical levels of smoke. Frequent low-to-moderate severity fire was one of the more important ecological processes in the Klamath Province as well as in the eastside and southern Cascades. The structure, composition, productivity and overall health and vigor of today’s forests are the consequence of various types of human intervention, and this includes long-term fire exclusion.

The absence of fire has decreased the abundance of some old-growth forest types that are dependent on frequent, low intensity fires. Substantial mortality is occurring on the Smith River NRA in knobcone pine, sugar pine, lodgepole pine, and Douglas-fir, creating large expanses of snag patches. Weather variations, whether related to long-term droughts or possible global warming trends, may also be increasing the number of dead trees and the amount of dead fuels. Also, topographic components of the Smith River NRA, that is, steep slopes, south-facing slopes, and funneling canyon winds from the dry interior, also contributes dramatically to the potential for high intensity wildfires. The Smith River NRA overall has large areas in the high to extreme fire hazard category. The extremely steep topography is a major component of this characterization.

A current shift is taking place towards larger area (several hundreds of acres) understory fuel treatments to counteract the unintended fuels buildup that have resulted from several decades of aggressive suppression. The first large area understory burn for hazard reduction was carried out on the Smith River NRA in May 1994. Its shaded fuel break and adjacent understory burn included approximately 550 acres and was designed to protect the community of Gasquet from wildfires burning westward through the Middle Fork Smith River canyon. Since then several other fuel breaks have been planned and constructed in strategic locations around communities within the district boundary (see project specifics in Appendix C).

Approximately 3,100 acres of fuels reduction treatments around communities have been completed with an additional 1,819 acres of the *Big Flat Vegetation Management and Fuels Reduction* project currently being implemented. The *Gordon Hill Vegetation Management and Fuels Reduction* project just finished the planning stage and will soon start the implementation phase, which proposes fuels reduction/restoration on 2,749 acres. Fuel treatments are being planned and implemented on the Smith River NRA to help restore the natural fire cycle by use of prescribed burning.

Environmental Consequences

All Alternatives: Direct and Indirect Effects

Roads provide access not only for accomplishing the suppression side of fire, allowing rapid response and safe deployment of firefighting resources, but also for fuels treatment to prevent catastrophic fire. Roads can be an impediment to fire spread at low fire intensity levels by acting as fuel breaks, which can aid in fuel treatments and suppression efforts; and act as anchor points and escape routes for fire personnel. Generally, the more heavily traveled roads with wider un-vegetated prisms provide the greatest assistance as fire breaks for fire suppression efforts. Roads provide a means for efficiently and safely transporting firefighters, materials and equipment.

Recent fire records show human caused fires tend to cluster along major highways, county roads, ML 3, 4, and 5 roads, and near communities and developed campgrounds. Human causes have accounted for the largest number of ignitions of wildfire for the past 37 years of fire history on the Smith River NRA; however, lightning occurs frequently throughout the forest, often with multiple ignitions from the same storm, and is responsible by far for the greatest number of acres burned for the past 37 years.

Roads do create access that could increase human caused fires, but roads also decrease initial attack response times. Roads represent escape routes for firefighters engaged in fire suppression and access for hazardous fuels reduction work. Communities and other private landowners depend on the Forest Service for wildland fire suppression services. The road network in support of these private parcels will assist efforts to protect private lands and structures. In the event of an emergency (i.e. fire suppression, search and rescue, or law enforcement action, etc.), access for emergency responders shall be exempted from prohibition which officially closes routes (whether it is designated on the transportation system or not) (see 36 CFR 261.13).

Roads serve as escape routes for area residents in the case of emergency evacuations. The CWPP states that a first priority for defensibility of communities at high risk of wildland fire is to create strategically located shaded fuel breaks utilizing major road systems and ridge tops around the communities. No major ridge top (ML 3, 4, or 5) roads are proposed to be decommissioned from the NFTS or downgraded to ML 1 in this project.

In 2005, the Smith River NRA published its RAP/OHV strategy. During this process, roads/routes were analyzed and deemed either high, medium, or low based on fire management and fuels treatment needs. Routes were identified that provided necessary access for fire suppression activities and fuels treatment opportunities.

The RAP identified key questions and issues affecting road-related management on the forest. Each team member used resource-specific evaluation criteria that had been developed to determine risk and/or need of each ML 1, 2 and UAR. Fire and fuels were considered an administrative need in this process.

Every ML 1 and 2 road and inventoried UAR on the Smith River NRA was evaluated for current or future fuels management or fire suppression need. Each road was given a high, medium, or low rating using the evaluation criteria based on the following: primary purpose of the road, road accesses existing or proposed developments for suppression efforts, road provide access to or serve as a control line for residential areas, road provide access to areas requiring fuel treatments, and does the road serve or will it serve as an established fuelbreak. The evaluation included such factors as cost efficiency (quicker, easier access), firefighter safety, difficulty of the terrain, etc. Duplicate-access roads/routes were not identified as high fire need roads/routes.

Findings from the 2005 Smith River RAP, identified approximately 207 miles of ML 1, 2 roads and UARS as high need fire roads/routes to be designated on or kept on the NFTS. Maintenance Level 3, 4 and 5 roads provide an additional 151 miles of access that will not be changed or modified under this action.

After reviewing the spring 2001 issue of *Fire Management* provided during the scoping comment period, we found that the issues raised in the article were similar to the criteria used by the Smith River NRA fire personnel to evaluate the road system, which led to the proposed action of removing routes/miles of road across on the district. All roads/routes were evaluated, while keeping in mind not all roads are needed to effectively suppress wildland fires and fire managers do not need all roads to complete hazardous fuels reduction work.

The routes identified will help firefighting efforts by having fuel breaks already in place, when suppression efforts are needed (fuel breaks have proven to be an effective tool on the Smith River NRA during the 1996 Panther Fire and on the SRNF during the 1999 Megram Fire (Jimerson and Jones 2000)). These breaks will provide a safer means for managing prescribed fire by reducing risk of an escape and permit the efficient re-introduction of fire into the ecosystem.

Although some authors such as Inglesbee question the use of fuels breaks in the article *Fuel breaks for Wildland Fire Management: A Moat or a Drawbridge for Ecosystem Fire Restoration*, others have found that fuel breaks have been effective (Agee and Skinner 2005, Jimerson and Jones 2000) including fuel breaks constructed on Six Rivers. Agee (2000) concluded, “A well-designed fuel break will alter the behavior of wildland fire entering the fuel-altered zone. Both surface and crown fire behavior may be reduced. Shaded fuel breaks must be created in the context of the landscape within which they are placed. Landscape-level treatments such as prescribed fire can use shaded fuel breaks as anchor points, and extend the zone of altered fire behavior to larger proportions of the landscape. Therefore, reducing surface fuels, increasing the height to the live crown base, and opening canopies should result in (a) lower fire intensity, (b) less probability of torching, and (c) lower probability of independent crown fire.” Fuel treatments are being planned and implemented on the Smith River NRA to help restore the natural fire cycle by use of prescribed burning.

Alternative 1, No Action

This alternative would maintain existing NFTS roads identified as the high fire priority road system, but will not designate any high fire need UARs (approximately 12.42 miles) to the system or upgrade (improve accessibility) any existing system road.

As stated above, roads provide access not only for accomplishing the suppression side of fire management, allowing rapid response and safe deployment of firefighting resources, but also for fuels treatment to prevent catastrophic fire.

No major ridge top (ML 3, 4, or 5) roads are proposed to be decommissioned from the NFTS or downgraded to ML 1.

Although CFR 261.13 allows any road/route to be opened in emergencies, rapid response to a fire could be hampered by lower accessibility of the roads/routes (i.e. poor drivability). Fire size and costs may increase if access is delayed.

Technically, the No Action alternative appears to be the best option for fire access; however, this alternative will not designate high fire need UARs or upgrade existing roads. NTFS roads under the No Action Alternative would continue to have limited access due to their current condition (i.e. failures, and/or vegetation encroachment) without stormproofing.

Alternative 4

This alternative would reduce miles of the high fire priority road system by the decommissioning of 5.93 miles of high fire priority roads, downgrading of 11.40 miles of road to ML 1, and the restoration of drainage patterns on UARs on 1.02 miles.

Lower fire priority roads/routes proposed to be designated/upgraded will also provide access for fire and fuels management.

Approximately 188.65 miles or 91 percent of the high fire priority road system will be part of the NFTS under this alternative.

Alternative 5

This alternative would reduce miles of the high fire priority road system by the decommissioning 52.09 miles of high fire priority roads, downgrading of 37.31 miles of roads to ML 1, and restoring drainage patterns on UARs on 4.09 miles.

Lower fire priority roads/routes proposed to be designated/upgraded could also provide access for fire and fuels management.

Approximately 113.51 miles or 55 percent of the high fire priority road system will be on the NFTS under this alternative.

Alternative 6

This alternative would reduce miles of the high fire priority road system by decommissioning 5.94 miles of high priority fire system roads, downgrading of 13.51 miles of roads to ML 1, and restoring drainage patterns on UARs on 1.02 miles.

Lower fire priority roads/routes proposed to be designated/upgraded could also provide access for fire and fuels management.

Approximately, 186.53 or 90 percent miles of the high fire priority road system will be on the NFTS under this alternative.

All Alternatives: Cumulative Effects

Fire-regime condition classes on the Smith River NRA have been altered by fire suppression, logging, mining, and wildfire occurrence. A fire regime is the temporal and spatial pattern of fire occurrence and effects, typically described by fire return interval, seasonality, frequency, and severity. The natural fire-regime condition class of the area is generally comprised of frequent low intensity surface events (*ground cleaning* or litter burning events with little tree mortality) with infrequent high intensity events (which produced patches of overstory mortality).

Aggressive suppression activity over the last 80 years has resulted in unnatural fuel profiles that are more continuous, both horizontally and vertically. Given this increased fuel loading, future wildfires have become larger and more destructive than in the past. Weather variations, whether related to long-term droughts or possible climate change trends, have also increase the number of dead trees and the amount of available dead fuels.

Several fuels reduction projects (fuel breaks) are being planned and have been implemented in strategic locations around communities within the district boundary (see Smith River NRA cumulative effects project list). The goal of Smith River NRA vegetation and fuels management projects (see project specifics in Appendix C) are to create conditions for fire resilient/resistant forests and attempts to return fire to its natural place in the environment. Post-treatment, potential fire behavior would decrease and fire suppression effectiveness would increase. There would likely be less potential impacts to private property.

Over time, associated cost of fighting fire (within the project areas) will decrease as the effectiveness of the fuels reduction aide in keeping unwanted fires small.

Compliance with Forest Plan and Other Direction

The No Action alternative would provide the greatest amount of high priority fire access when compared to the other alternatives, even though this alternative will not designate high fire need UARs or upgrade existing roads. National Forest Transportation System roads under the No Action alternative would continue to have limited access due to their current condition (i.e. potential for failures) without stormproofing.

A comparison of high fire need roads by alternative show that there is no significant difference concerning access for fire suppression activities and fuel treatment areas in Alternatives 4 or 6. Implementing Alternatives 4 or 6 would provide sufficient access for fire suppression and fuels treatment activities. Alternative 5 reduces access for fire and fuels management the most; and has the greatest negative impact on rapid response and safe deployment of firefighting resources, and fuels treatment opportunities into the future (see Table 3-33).

Table 3-33. High fire-need roads on the NFTS by alternative.

Alternative Comparison	Alternative1	Alternative 4	Alternative 5	Alternative 6
Percent of high fire need roads	94%	91%	55%	90%
Total miles of high fire need roads	194.6 miles[23] No additions or upgrades	188.65 miles	113.51 miles	186.53 miles

Ranking for fire and fuels access by alternatives is as follows: 1 to 5 (1 being low fire/fuels treatment access and 4 being most fire/fuels access by alternatives). This is displayed in Table 3-34. The No Action alternative, Alternative 1, appears to be the best option for fire access, when actually this alternative will not add high fire need routes or upgrade existing roads/routes. National Forest Transportation System roads under the No Action alternative would continue to have limited access due to their current condition (i.e. failures, and/or vegetation encroachment) without stormproofing.

Table 3-34. Alternative ranking comparison.

Alternative Ranking	Alternative 1	Alternative 4	Alternative 5	Alternative 6
Miles of high fire need routes/roads to be added	4	3	1	2

Roads provide access not only for accomplishing the suppression side of fire management, allowing rapid response and safe deployment of firefighting resources, and also for fuels treatment to prevent catastrophic fire. No major ridge top or main access (ML 3, 4, or 5) NFTS roads are proposed to be decommissioned or downgraded to level 1 in this project.

[23] Two-hundred seven (207) miles of roads were identified as high need for fire suppression access and fuels treatment projects and compared to proposal for each alternative.

Alternatives 4 and 6 maintain at least 90 percent of the high fire priority road system, which will provide sufficient access for fire and fuels management needs into the future. Alternative 5 maintains 55 percent of the high fire priority road system, which may result in longer response times, larger fires, and higher suppression costs. Roads can be an impediment to fire spread at low fire intensity levels by acting as fuel breaks, which can aide in fuel treatments and suppression efforts; and act as anchor points and escape routes for fire personnel.

Geology

Introduction

Forest management activities, including the designation, development and maintenance of transportation systems, can result in ecosystem damage when the activity's location, design, construction, or implementation are not based on an understanding of geologic conditions and geomorphic processes.

Geologic resources are important underlying elements of all aspects of NFS lands. Geology influences watershed morphology and response, soil types, and other essential aspects of NFS lands. Geologic resources managed on NFS lands include locatable and common variety mineral deposits, caves, paleontological resources, geologic special interest areas, and groundwater. Geologic hazards can impact public safety on NFS lands. Hazards can include slope stability issues and mining-related hazards.

The pertinent geologic hazards within the project area are active landslides, unstable slopes and areas, which have the potential to contain naturally occurring asbestos (NOA). Public health concerns regarding NOA, as well as management actions that can minimize these concerns are located in the *Transportation* section within this chapter. The project area on the forest does not have any known significant paleontological sites, caves, or groundwater aquifers. Mineral exploration and development would not be affected by motorized travel management.

Analysis Framework: Statute, Regulation, Forest Plan, and Other Direction

The following statutory authorities govern geologic resources and services activities essential to Forest Service programs:

Forest and Rangeland Renewable Resources Planning Act of 1974 (RPA)

This act (88 Stat. 476; 16 USC 1600-1614) as amended by NFMA (90 Stat. 2949; 16 USC 1609) requires consideration of the geologic environment through the identification of hazardous conditions and the prevention of irreversible damages. The Secretary of Agriculture is required, in the development and maintenance of land management plans, to use a systematic interdisciplinary approach to achieve integrated consideration of physical, biological, economic, and other sciences.

Asbestos Airborne Toxic Control Measure (ATCM) for Surface Application

The ATCM rule was adopted by the California Air Resource Board (CARB) in 1990 and amended in 2000. The amendment lowered the asbestos content to 0.25 percent for asbestos-bearing ultramafic rock materials used for surfacing applications subjected to vehicular, pedestrian or non-pedestrian use, such as cycling and horseback riding. In remote areas, the naturally occurring asbestos (NOA) content can be as high as 1 percent without concern.

Federal Cave Resources Protection Act of 1988

This act (102 Stat. 4546; 16 USC 4301 et seq.) provides that federal lands be managed to protect and maintain, to the extent practical, significant caves.

Region 5 Regional Forester's Direction on Naturally Occurring Asbestos

The regional forester provided direction on February 11, 2009, addressing NOA on national forest lands in California. "Any land management decisions regarding NOA must be based on sound data and analysis. According to EPA, the scientific assessment and identification of actual public health risks associated with NOA is a complex and time intensive process. Until such studies are performed, the Region will not have definitive information regarding actual employee and public health risks posed by NOA on national forest lands. Therefore, no decisions are being made or direction issued at this point in time to restrict or alter public access to and/or recreational use of the national forests." The letter further directs forests to make the public aware of the potential risk of NOA and its presence on national forest lands as well as guidance on how visitors can reduce their exposure to the substance. This is directed at public access or recreational use that is currently permitted on the forests.

Region 5 Regional Forester's Naturally Occurring Asbestos Clarification on Interim Direction issued June 30, 2009

Per clarifying direction issued on June 30, 2009, any new proposed activities or projects on the forests that require NEPA would analyze NOA just like any other environmental hazard or concern. As an example, a forest would not add unauthorized trail segments to the travel management plan until analysis of the segment for NOA, water quality issues, fisheries or other issues of concern were analyzed.

1995 Six Rivers National Forest Land and Resource Management Plan (Forest Plan)

There are three areas pertaining to geologic resources within the Forest Plan that influence this project. They are the physical environment, special interest areas (SIAs) and riparian reserves. The following are goals and direction related to the physical environment:

Goals

- The primary management goal is maintenance of long-term soil productivity and high water quality.
- Identify geologic hazards and minimize the impacts from management activities on streams and facilities.
- Plan and conduct all forest management activities to maintain existing water quality or, where degraded, restore water quality to meet State water quality standards for the North Coast Region.
- Maintain the integrity of watersheds and riparian ecosystems, including riparian zones, for the protection or enhancement of riparian-dependent resources.

Direction

- Manage soil and water resources to protect and enhance long-term productivity of the forest, water quality, associated beneficial uses, and aquatic ecosystems.
- Program emphasis is to avoid or mitigate the impacts of management activities on slope instability, water quality and soil productivity.
- Identify watershed improvement needs to be included on the forest's Watershed Improvement Needs Inventory. Prioritize projects based on severity, needs, effects on beneficial uses, and potential for recovery.
- Design all resource management activities to meet state water quality criteria. Best management practices will be applied in planning, implementation and maintenance of all forest activities as means to achieve water quality standards. Proper installation, operation and maintenance of state-approved BMPs are presumed to meet the manager's obligation for compliance with applicable water quality standards as well as compliance with the Clean Water Act (EPA, Water Quality Standards Handbook, Chapter 2, 1987/ MAA with SWRCB 1981.).
- Assessments of the cumulative effects of project level activities on soil and water resources will be provided during project analysis at whatever level of analysis is necessary (site, watershed, or basin).

Forest Plan standards and guidelines for geologic resources are displayed in Table 3-35.

Table 3-35. Forest Plan standards and guidelines for geologic resources.

Topic	Forest Plan Standard and Guideline
Management Area 9 – Riparian Reserves	Riparian reserves are specified as follows (only the specifications that pertain to geologic areas are listed here): • The extent of unstable and potentially unstable areas (including earthflows).
	As a general rule, standards and guidelines for riparian reserves prohibit or regulate activities in riparian reserves that retard or prevent attainment of the ACS objectives. Watershed analysis and appropriate NEPA compliance is required to change Riparian Reserve boundaries in all watersheds.
Management Area 10 – Special Interest Area	Adverse impacts to riparian/wetland areas shall be mitigated through educational means, barrier placement, fencing, or access closure.
	Development of water and rock sources, stockpiling of rock materials and water sources within the areas are not compatible with the management direction for SIAs.
	Roads that are identified as contributing to resource damage shall be repaired to mitigate the problem, closed on a seasonal or year-round basis, or decommissioned. The course of action will depend on the severity of the resource problem and the potential for continued damage.
	Consider existing routes (old roads, trails) within the areas for designation as multiple-use routes where possible and appropriate. If identified as appropriate during SIA recreation planning, use existing routes for public access. Construct new routes as necessary to direct use so as not to impact sensitive areas and/or to encourage access to areas with interpretive values.
Soil Erosion and Mass Movement	1-6. The potential for increased mass movement and soil erosion will be addressed for proposed timber harvest and road building. Landslide hazard maps and a risk assessment should be developed for timber harvest planning. Alternate road specifications or road locations should be evaluated where proposed management would increase the potential for mass movement and soil erosion.
	1-7. Roads, landings, and timber harvest units will be located and designed to avoid triggering or accelerating mass movements that would adversely affect a stream or degrade a commercial
Transportation and Facilities	For each existing or planned road, meet ACS objectives by: • Preparing operation and maintenance criteria that govern road operation, maintenance, and management.

Topic	Forest Plan Standard and Guideline
	• Minimizing disruption of natural hydrologic flow paths, including diversion of streamflow and interception of surface and subsurface flow. • Minimizing sediment delivery to streams from roads. Outsloping of the roadway surface is preferred, except in cases where outsloping would increase sediment delivery to streams or where outsloping is not feasible or unsafe. Route road drainage away from potentially unstable channels, fills, and hillslopes. • Regulating traffic during wet periods to prevent damage to riparian resources.

Effects Analysis Methodology

This section describes the methodology and assumptions used for the effects analysis of the alternatives. Impacts relevant to geologic hazards, resource specific assumptions, resource indicators, sources of information, timeframes (short-term and long-term), and spatial boundary of the effects analysis are addressed. The information and methodology behind the effects analysis is based on the best available science and is cited in this document.

The effects analysis will focus on the methodology and indicators for addressing the direct and indirect effects of each of the four types of actions that are elements of the alternatives, and the cumulative effects of implementing an alternative including the effects of ongoing and reasonably foreseeable actions.

Assumptions Specific to the Geological Resource Analysis

For every scientific analysis, it is necessary to make some assumptions. For this project, the assumptions made are necessary because: 1) variable geologic conditions are present on the ground, 2) the routes already exist, and 3) the project area is large.

See the introduction to this chapter for a list of common assumptions and limitations. The geology effects analysis assumptions are common to each of the actions within each alternative:

- The stability of active landslides, toe zones, landslide deposits and inner gorges is sensitive to ground-disturbing activities and concentration of water from roads. Gouging and gullying on these sensitive areas due to motorized travel on the hillslopes and the road surfaces can concentrate water, increasing the landslide potential.
- Most of the UARs considered in this analysis were established through repeated use by motor vehicles and do not have cuts and fills.
- Road maintenance, especially on roads with cuts and fills, can reduce landslide risk. Maintenance activities (such as cleaning culverts and ditches) maintain drainage, keep water off road surfaces, and reduce the potential for failures of fills.
- All designated motorized trails will receive maintenance, which will adequately prevent water from concentrating on the route surface. Trails maintenance is largely focused on keeping waterbars effective.
- Routes in sensitive terrain (dormant and active landslides) are more likely to instigate mass wasting than routes on stable terrain.

- Routes already on the landscape that pose a threat to slope stability will not fully recover without restoration; therefore, the impacts to slope stability will continue, at least in the short term, until restoration of undesignated routes is complete.
- Hillslope hydrology altered due to re-routing of water by the existing road prism will be corrected when: a) existing UARs that are not designated to the NFTS are restored to natural drainage patterns; b) designated routes with altered hydrology are improved to route water more naturally; or c) NFTS roads with drainage problems are stormproofed.
- Vegetation recovery will ultimately reduce, but not eliminate, the landslide potential in currently disturbed areas.
- The timeframes for this analysis are based on measurable changes in landslide potential in the forest due to revegetation of disturbed areas. A short-term timeframe of 1 to 5 years is defined, based on the amount of time it typically takes for vegetation of to become reestablished after a disturbance has been discontinued. At 5 years, the root support from the vegetation begins to stabilize the ground and landslide potential begins to decrease measurably. A long-term timeframe of 50 years is defined, based on revegetation by large trees, which provide significant root support and hydrologic relief to unstable land. Root support, interception of precipitation and evapotranspiration can substantially reduce the landslide potential of an unstable hillslope.
- All areas underlain by ultramafic bodies are considered to potentially contain naturally occurring asbestos unless testing indicates otherwise. Serpentine and ultramafic bedrock is more likely to contain NOA than other bedrock types found within the project boundary. Published geologic maps accurately represent the extent of these rock types (Harper 1980; Irwin 1994; USDA Forest Service 2012).

Data Sources

- **Smith River Roads Analysis and Off Highway Vehicle Strategy (2005):** A synthesis of existing data, aerial-photo reconnaissance, and field investigation provided ratings of mass wasting potential related to existing roads and routes in the analysis area. These ratings were carried forward in the risk-need table used for this analysis.
- **GIS Analysis:** The inventoried transportation network was analyzed with respect to sensitive geologic terrain and rock types known to have the potential to bear naturally occurring asbestos (NOA). These results were used to compare the proposed activities under each alternative with the selected geo-indicators. The bedrock and geomorphic data were derived from the Northern Province and SRNF GIS spatial geodatabases for bedrock geology, geomorphology and active landslides. (USDA Forest Service 2012, 2013).
- **Naturally Occurring Asbestos Sampling:** Sampling of a selection of road and route surfaces for asbestos concentrations across the forest, including the analysis area, was conducted by a contractor (Engineering/Remediation Resources Group, Inc. or ERRG) for the Forest Service. The results of this sampling are discussed in the *Affected Environment* section below.

- **Griffin Creek Bridge Replacement Geotechnical Review:** In May 2015, MGE Engineering submitted a review document summarizing the pertinent geologic and geotechnical aspects of the proposed Griffin Creek bridge replacement (MGE Engineering 2015). This review document was authored by Martin McIlroy and Franklin Taber of Taber Consultants, and incorporates the 1977 Griffin Creek Bridge Site Surface Exploration geotechnical report, authored by Forest Service geotechnical engineer Jon Paulsen. This document, along with information provided by Victor Dumlao, the forest's transportation planner, provides the basis for the geologic effects analysis of this project component.

Indicators

Geologic changes occur not only over spans of geologic time, but also at observable intervals of time that can be monitored or measured. Geo-indicators have been developed by the International Union of Geological Sciences as high-resolution measures of short-term changes in the geologic environment, which are important for environmental monitoring and assessment for use in environmental reporting and ecosystem management (FSM 2880.61, paragraph 2). The first two indicators were considered, but not chosen for effects analysis, because effects of proposed activities related to these indicators would not occur at a measurable or significant level.

Unique Geologic Areas

Easier access to special interest areas, natural research areas and caves may increase the frequency of visits to the location. (There are no known caves in the analysis area, nor are there any designated geologic special interest areas. Four special interest areas related to botany are located within the analysis area, and they are noteworthy for unique geologic characteristics.) Enhanced access in itself is not detrimental to the resource. However, increased access to unique geologic areas has the potential to increase vandalism in sensitive areas. There has been little to no notable damage to the resource thus far, and a minimal length of routes (approximately two miles) is proposed to be designated to the transportation system in any alternative that pass through or to the unique geologic areas. Therefore, the risk to unique geologic areas from this project is considered minimal.

Paleontological Resources

There are sparse paleontological resources in the analysis area. The most noteworthy are plant fossils that have been found in the Wimer Formation, mostly near French Flat. While some existing roads and proposed routes do pass through or near mapped Wimer outcrops, to date there has been little to no notable damage to these paleontological resources. Therefore, the risk of damage or destruction of paleontological resources is minimal and will not be addressed further in this analysis.

The following indicators will be used to compare the differences in geological effects between alternatives:

Slope Stability – Miles of road or route located on mapped dormant or active landslides.

Slope stability is a concern both in a route's role in potential landslides and how a landslide would affect a route. Roads affect hillslope hydrology and can concentrate surface runoff onto sensitive ground, increasing the potential for landslides. Damage to routes as a direct or indirect result of slope instability is a potential physical hazard to motorists. The sediment delivered to streams and hillslopes by landslide activity can be exacerbated by the presence and use of routes.

Asbestos Hazard – Miles of road or route located on mapped ultramafic rock.
Asbestiform minerals are naturally occurring fibrous silicate minerals that are commonly associated with ultramafic rock, including serpentinite (Van Gosen 2007). Asbestos exposure has been associated with several forms of lung and esophagus diseases. In order for asbestos to be a public health issue, it must be released as dust into the air and inhaled by a human. The greatest potential risk related to motorized travel occurs when dust is generated by vehicle passage over a native surface that is high in asbestos. Inhalation hazard is particularly high in an open, as opposed to enclosed, vehicle traveling close behind another vehicle, and at higher speeds such as on a mixed-use road on a straight road segment.

Effects Analysis Methodology by Action – Direct and Indirect Effects

The two indicators selected for effects analysis are used to evaluate the direct and indirect effects of each of the four types of actions (listed below) for each alternative. Direct effects are those effects which are caused by the project actions and which occur at the same time and place as the action. Indirect effects are those caused by the action, which occur later in time or removed in distance from the location of the action. Direct and indirect effects of each project alternative will be analyzed and compared separately for the five action components.

Action 1. Designation of New NFTS Routes

Some action alternatives propose designation of UARs and trails as NFTS roads or motorized trails, and identify vehicle class and, if appropriate, season of use for those proposed additions. Where resource risks related to the presence or use of these roads or motorized trails have been identified, mitigation measures including seasonal gate closure, road surface improvement, route delineation, posting of speed limits, dissemination of public information regarding risks, and route drainage improvement are proposed as conditions of designating these as NFTS facilities. These types of mitigations are described in detail in the *Alternative Descriptions* section of Chapter 2, and in this chapter by resource. Although all of the routes proposed for designation currently exist on the landscape (no new construction is proposed), these designations are analyzed with respect to any additional slope stability hazard or asbestos exposure hazard they may present compared to the existing authorized road system (the NFTS represented on the MVUM). Implementation of the mitigation measures listed above should reduce the risks described by both geo-indicators. A few routes would be designated as closed (ML 1) roads; therefore, the potential asbestos exposure hazard to the public on these routes would not change. Any reduction in risk levels from proposed mitigations is difficult to quantify; therefore, the analysis treats all proposed added mileage as presenting equal risk as measured by the geo-indicators.

Analysis Method: Comparison of alternatives by GIS analysis of length in miles of proposed route designation by indicator: a) tabulation of mileage of proposed designations within areas of active or dormant landslides; and b) tabulation of mileage of proposed designations (excepting those designated as ML 1) within mapped areas of ultramafic bedrock.

Action 2. Changes to road maintenance status, vehicle class and season of use

The action alternatives include limited changes to the vehicle class and other use restrictions on existing NFTS roads and/or trails. The proposed limited changes to the existing NFTS road network include designating mixed use (managing a given route as both a motorized trail and a road), upgrading roads from ML 1 to 2, downgrading roads from ML 2 to ML 1, and changing the season of use (seasonal closures – see *Port-Orford-Cedar* section within this chapter). In addition, three alternatives propose designating parking areas adjacent to Road 17N49 on Gasquet Mountain, a popular destination for OHV use. Resource risk mitigations as described above may apply.

This action component is difficult to analyze effectively with regard to slope stability, even qualitatively. Mass wasting and surface erosion depend on hydrologic-topographic interactions, which are site-specific. On roads that intercept and concentrate groundwater or overland surface flow, the mass wasting potential due to the road would, in most cases, remain the same. Concentrated water would continue to saturate or otherwise undermine the stability of the hillslope or fill, regardless of the type or season of use. Road closure without decommissioning can increase slope instability because regular inspection and maintenance of road drainage is eliminated. However, roads with high hydrologic or geologic risk have already been identified and proposed for drainage improvements or decommissioning during roads analysis. In addition, ML 1 roads, when closed, are to be left in a free-draining state that should reduce failure potential related to drainage concentration. For higher maintenance level roads, even substantial changes in traffic patterns are unlikely to have measurable effects on slope stability, except where the factor of safety for a given natural hillslope or road prism is already very close to failure conditions. Given these considerations, no quantitative analysis of changes in slope stability hazard related to changes in NFTS classification has been attempted.

Likewise, there are unlikely to be detectable differences in effects to health risks due to these actions. Seasonal gate closures would likely slightly reduce the overall immediate risk from landslide impacts to motorist safety, but the aggregate risk would change little due to light winter use of routes. The change in type or season of use of the existing NFTS will not alter the presence of NOA along roadways. Seasonal differences in use may change the degree of exposure to potentially hazardous asbestos-bearing dust, but since seasonal closures would occur in the wet season, when route usage is lighter, and increased moisture tends to reduce the ability of dust to become airborne, this action would probably effect a minor reduction if any in overall exposure risk. Designation of mixed use and the designation and improvement of parking areas may slightly increase the risk of asbestos exposure due to increased visitor use in an area of known ultramafic and NOA presence. However, these changes in risk are difficult to quantify and will be only discussed qualitatively in the effects analysis. The only changes in use of existing NFTS roads that may measurably affect this geo-indicator are maintenance level downgrades to ML 1 (closed) status, and maintenance level upgrades from ML 1 to ML 2 or 3 (open to travel) status, on roads that cross ultramafic bedrock. Therefore, only these subsets of this action component will be analyzed.

Analysis Method: Comparison of alternatives by GIS analysis of net length in miles of proposed changes in maintenance levels by one indicator: tabulation of net mileage of proposed maintenance level changes within mapped areas of ultramafic bedrock.

Increases in mileage of open roads on ultramafic bedrock may correspond to slight increases in asbestos hazard risk to human health. Decreases in mileage of open roads on ultramafic bedrock may correspond to slight decreases in risk of exposure to NOA. Road closure (downgrade) and road opening (upgrade) are analyzed as having equivalent but opposite effects.

Action 3. Decommissioning roads

The action alternatives may include decommissioning of existing NFTS roads. Decommissioning of roads is considered in order to respond to a variety of criteria, including reducing damage to soil, vegetation, and other forest resources; reducing wildlife habitat fragmentation; and effective distribution of resources for maintenance and administration needs of roads, trails and areas that would arise if the uses under consideration are designated.

Analysis Method: Comparison of alternatives by GIS analysis of length in miles of proposed road decommissioning by indicator: a) tabulation of mileage of proposed decommissioning within areas of active or dormant landslides; and b) tabulation of mileage of proposed decommissioning within mapped areas of ultramafic bedrock.

In contrast to the above effects analysis method descriptions, greater mileage of this proposed activity by indicator would result in decreased risks of slope instability and exposure to NOA.

Action 4. Restoration of Drainage Patterns on UARs

The action alternatives may include restoration of drainage patterns on UARs. Restoration of drainage patterns is considered in order to respond to a variety of criteria, including reducing damage to soil, vegetation, and other forest resources; reducing wildlife habitat fragmentation; and effective distribution of resources for maintenance and administration needs of roads, trails and areas that would arise if the uses under consideration are designated. An additional action that would occur under all action alternatives would be physically barricading the access to UARs that are not added to the transportation system. This action would decrease the unauthorized use of these routes, intended or otherwise, and consequently would reduce the risks associated with vehicle traffic measured by the geo-indicators. As the amount of unauthorized use is not well known, no attempt has been made to quantify this additional risk reduction associated with barricading. However, it is discussed briefly in the effects analysis for each alternative.

Analysis Method: Comparison of alternatives by GIS analysis of length in miles of proposed route restoration by indicator: a) tabulation of mileage of proposed route restoration within areas of active or dormant landslides; and b) tabulation of mileage of proposed route restoration within mapped areas of ultramafic bedrock.

Similar to the road decommissioning analysis method description, greater mileage of this proposed activity by indicator would result in decreased risks of slope instability and exposure to NOA.

Action 5. Griffin Creek Bridge Replacement

Replacement of a damaged and failing bridge over Griffin Creek, on Forest Road 18N07 at MP 0.0, at its junction with US Highway 199, is proposed in each action alternative. This action is necessary to provide for motorist safety, and to maintain access to a substantial portion of the forest road and route network in the northeastern portion of the project area.

Analysis Method: The bridge replacement action is analyzed in terms of its site-specific effects with regard to slope stability and the potential for asbestos exposure. The additional element of seismic risk to the existing and proposed replacement structure is considered briefly. Similar to the above discussion of potential effects to other geologic resources, the bridge replacement action should have negligible effects to groundwater, unique geologic areas or paleontological resources, and so effects to these resources will not be addressed further in this analysis.

Cumulative Effects

The cumulative environmental effects of this project on slope stability ultimately impact water quality and the integrity of the transportation network. They are addressed within the *Hydrology and Water Resources* and *Transportation Facilities* sections. The hydrology analysis includes the projected water quality effects of past, present and future foreseeable actions within the cumulative watershed effects analysis area, which encompasses the geologic analysis area.

Cumulative impacts on human health are specific to the individual and depend on their personal history. They are not analyzed here because they are beyond the scope of this analysis.

Affected Environment

The forest occupies portions of the northern Coast Range and Klamath Mountains geologic provinces. The forest boundary stretches southward from the Oregon border for approximately 140 miles. The affected analysis area is the Smith River NRA, which is coincident with the Gasquet Ranger District, located in the Smith River watershed from the Oregon border south about 35 miles to Red Mountain, and from about 10 miles inland from the Pacific Coast east to the Siskiyou Crest.

The Smith River NRA includes 358,759 acres, or 561 square miles. The analysis area for the project is somewhat reduced as described in the Alternatives description. It includes the Smith River NRA/Gasquet Ranger District exclusive of declared wilderness, traditional cultural properties (TCPs), and outlying NFS lands. Only roads and routes on NFS lands within the described area are considered in the analysis.

Geologic Setting and Bedrock Geology

The analysis area occupies a montane upland area of the western Klamath Mountains geologic province, and a small portion of the Coast Range geologic province. The Klamath Mountains consist of a number of accreted terranes of Paleozoic and Mesozoic age intruded by plutonic igneous rocks both during and following accretion to the North American continent. Accreted terranes are defined by Irwin (1972, 1989) as discrete tectonostratigraphic units that have been transported, subducted, and sutured to the North

American margin by plate tectonic processes. The project area is dominantly within the Smith subterrane of the Western Klamath terrane, the westernmost of the Klamath accreted terranes. Ultramafic rocks of the Josephine Ophiolite predominate, with lesser proportions of associated intrusive rocks and of Galice Formation metasediments (Figure 3-1). The easternmost portion of the area is underlain by rocks of the structurally lower Rattlesnake Creek Terrane. The Rattlesnake Creek Terrane is composed of diamictite and mélange (tectonically mixed lithologies with a wide range of textures), and includes metasediments, metavolcanics and serpentinite, with blocks of limestone, chert and conglomerate. It belongs to the Western Paleozoic and Triassic Belt of Irwin (1960), and consists of Permian to mid-Jurassic age rocks accreted in the Jurassic. The Galice Formation, which conformably overlies the ophiolite, consists of metasedimentary rocks of Jurassic age, comprising a turbiditic flysch sequence of sandstone and shale beds, displays prominent fining-upward (Bouma sequence) stratigraphy and is metamorphosed to varying degrees (Harper 1980, MacDonald et al. 2006). Along the western fringe of the analysis area and in its northwest corner, small areas of Yolla Bolly terrane rocks of the Franciscan Complex occur. These are also accreted rocks associated with the Coast Range province. The Yolla Bolly terrane is part of the Eastern Belt of Franciscan rocks, in this unit's closest proximity to the Pacific coast. It consists largely of moderately metamorphosed greywacke sandstones and finer-grained mudstones and shales, with some conglomerate and chert bodies, and is of Jurassic to Cretaceous age. Many areas of *broken formation* (disrupted fragments of stratigraphic packages) are present.

Landscape Setting and Evolution

Cycles of erosion, uplift, and incision have formed the modern landscape of the analysis area. Gentle upland topography relict of an ancient erosional surface is preserved on concordant ridge tops. The steep mountainsides and deep narrow canyons that characterize the landscape are the topographic expression of relatively recent tectonic uplift. Mass wasting processes are most active in inner gorge and lower hillslope settings, chiefly as shallow debris slides, although some active and many dormant slump-earthflows, rotational-translational landslides and other deep-seated landslides are present under forest canopy. Bedrock geology and hillslope position influence a mosaic of vegetation types, with ultramafic lithologies in upper hillslope positions representing the least productive sites and supporting sparse, often stunted forests and unique serpentinite-endemic vegetation.

The topography of the assessment area consists of a series of narrow linear ridges and valleys of generally oriented east-west to northeast-southwest, with gently convex concordant ridge tops whose elevations increase from west to east, from roughly 2,000 feet in the western portion of the area to 6,308 feet on Youngs Peak in the northeast. The base elevation of the area, at Douglas Park on the mainstem Smith River, is approximately 120 feet MSL. Steep narrow ridges and canyons predominate, although there are areas of broader, gentler topography in the area of Lower Coon Mountain in the west-central portion of the area, and in the High Plateau area east of the North Fork Smith River. Deep dissection of a former upland surface produced this topography. This surface has been dubbed the *Klamath peneplain* by some (Maxson 1933, Aalto 2006, Anderson 2008), after Diller (1902). It likely represents a late Cenozoic planation to sea level prior to uplift. The landscape is the westernmost extent of the Klamath Mountains geologic province in its closest proximity to the Pacific coast. Uplift of these ranges is associated with tectonic forces of convergence related to accretion and subduction, most recently during the ongoing Cascadia subduction event.

Surficial Geology

Surficial geologic deposits that mantle the older bedrock units are present across the analysis area landscape, and have relevance to landscape evolution and geomorphic processes that affect forest ecology and management. The most widespread of these is the late Tertiary Wimer Formation, which is associated with west-central occurrences of the old erosion surface representative of the *Klamath peneplain* as described above. It consists of erosional remnants of weakly consolidated shallow marine and near-shore sediments that are fossiliferous in places (Irwin 1997). The erosion surface itself is evident in ridge top positions across the western half of the analysis area (Figure 3-1). In a few locations in the eastern portion of the analysis area, Pleistocene cirque glaciation occurred (Figure 3-2), and glacial till is present in the upper canyon of the Middle Fork Smith River (Figure 3-1). Recent alluvial deposits (Qya) and slightly older stream terrace deposits (Qt) are present near the Smith River channel in the Hiouchi area.

Geomorphic Processes and Landforms

The project area encompasses a variety of landforms characteristic of the Klamath Mountains province and specific to the tectonic history and geologic setting of northwesternmost California. Rapid Late Tertiary uplift of the Miocene littoral zone and coastal plain, and subsequent deep incision under wet Pacific climatic conditions, have resulted in the existing landscape of high relief, subparallel to trellis drainage patterns, linear ridges and/or upland plateaus with gentle, broadly convex crests, and steep stream gradients. Deep-seated landslides, largely initiated under wetter Pleistocene climates, mantle much of the landscape and many presently inactive shallow rapid landslides are present as well (Figure 3-2). Most of these older mass-wasting features are dormant, although some recently active deep-seated slide activity has been noted in the analysis area. Recently active shallow rapid landslides are also common, generally on steep slopes in inner gorge and lower hillslope positions (Figure 3-2). The majority of these were initiated either prior to 1944 (the earliest aerial photographic record of the area), or during or immediately following the 1964 storm/flood event which is the flood of record in the area. Many of these have regained vegetative cover in the intervening half-century, and are no longer chronic sediment sources. In total, 113,638 acres of unstable hillslopes are mapped within the analysis boundary, covering 42 percent of the area. Landslides mapped as recently active cover 2,056 acres, or 0.76 percent of the area within the analysis boundary.

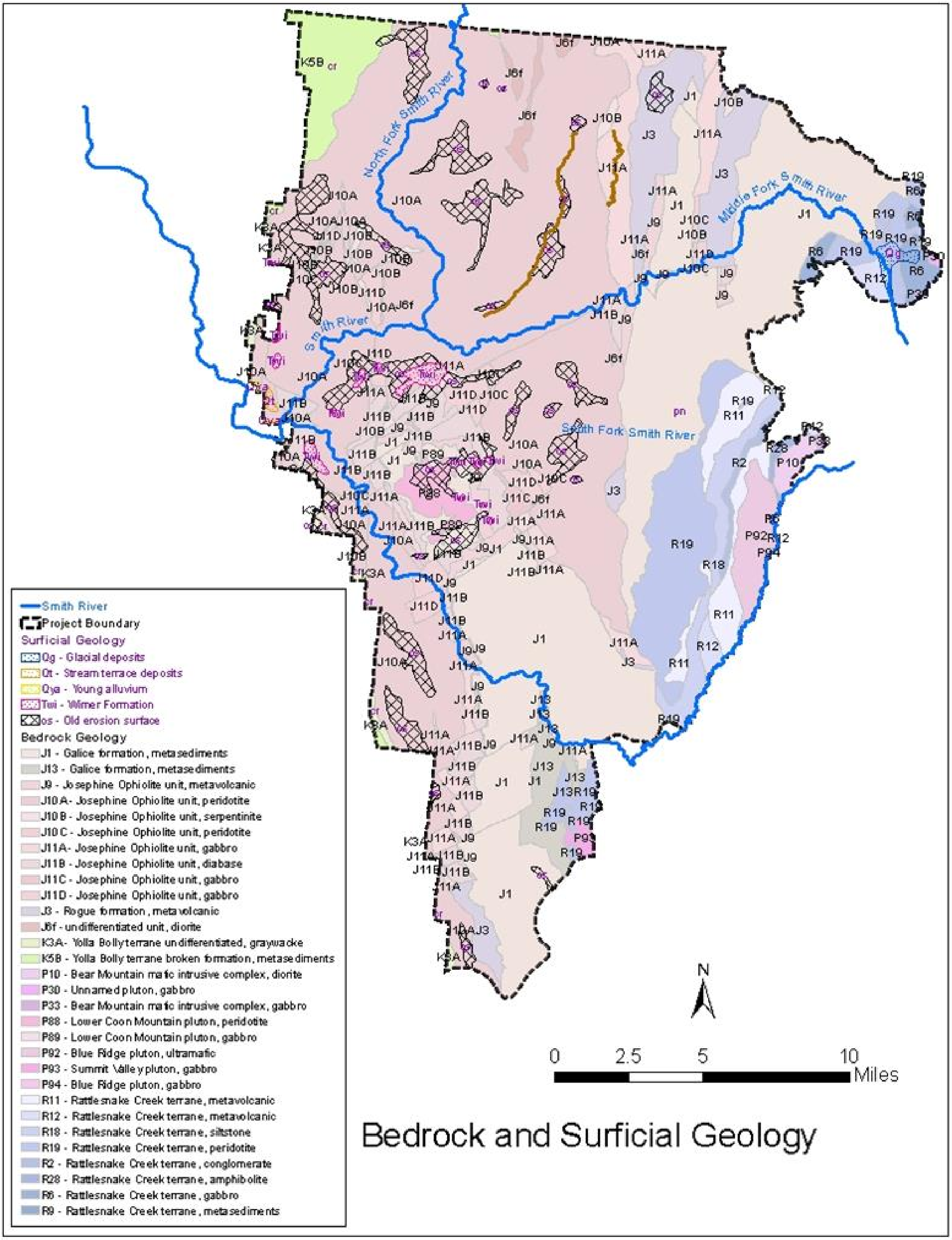

Figure 3-1. Bedrock and surficial geology.

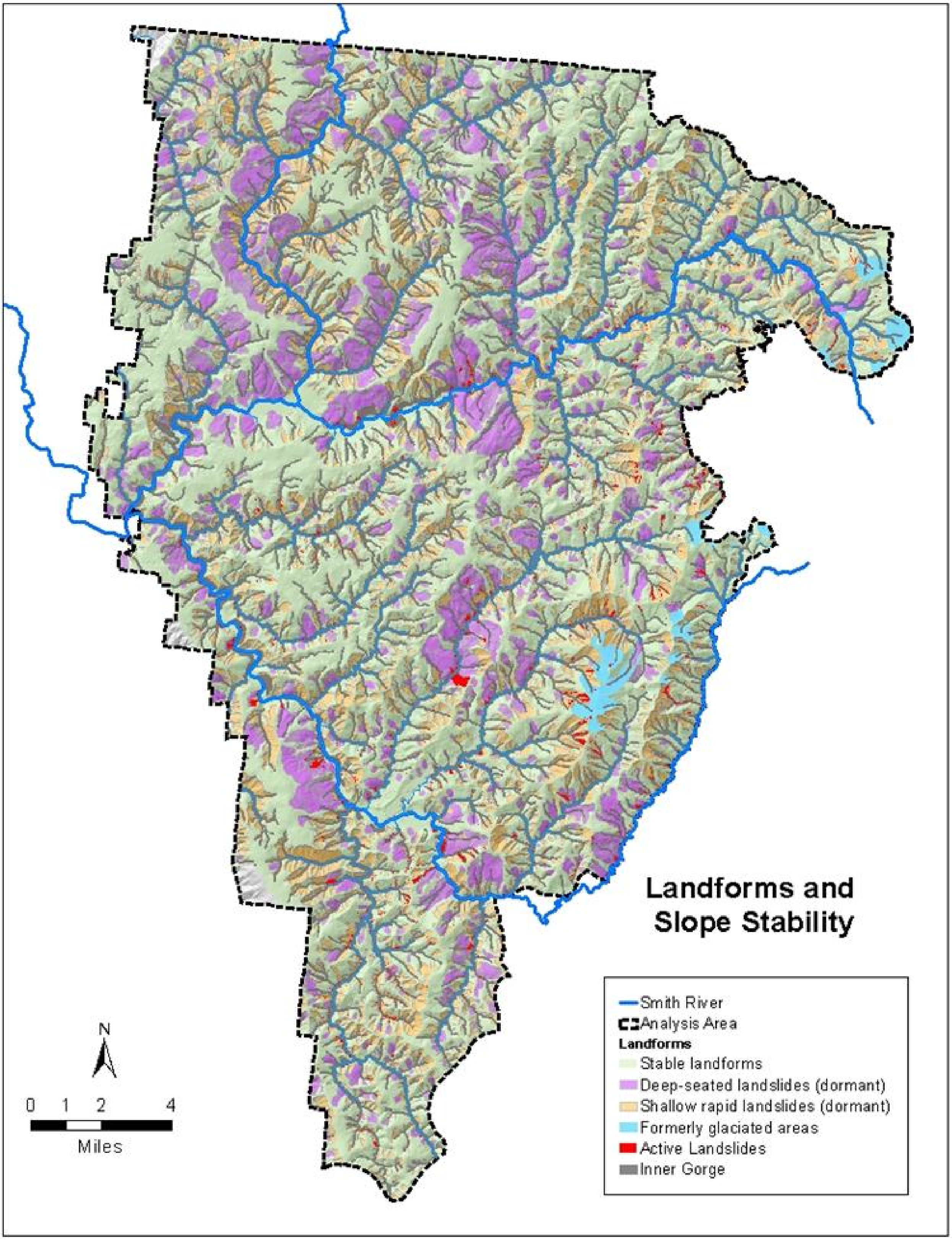

Figure 3-2. Landforms and slope stability.

Geologic Hazards – Naturally Occurring Asbestos

Aside from instability related hazards, there is one other relevant hazard within the analysis area, namely the presence of bedrock that may contain naturally occurring asbestos (NOA). Naturally occurring asbestos can be found within serpentinite and other ultramafic bedrock units (Van Gosen 2007, Van Gosen and Clinkenbeard 2011). A majority (138,000 acres or 51 percent) of the analysis area is underlain by these bedrock types. The mapped extent of lithologies that may bear asbestiform minerals is displayed in Figure 3-3.

Naturally occurring asbestos includes a suite of fibrous, silicate minerals that are commonly associated with ultramafic rock. Asbestos can pose a health hazard if it is released as dust into the air and inhaled by humans. The potential for exposure during vehicle travel is greatest for riders of all-terrain vehicles, which are open and provide no shielding from the dust, or for riders in multiple passenger vehicles traveling in close proximity with open windows. The degree of health hazard from chrysotile, the form of asbestiform mineral associated with serpentinite and the only form present in the analysis area, and the validity of risk assessment methods for asbestos exposure are topics subject to debate in the scientific, regulatory and health advocacy communities (Nicholson 1986; CARB 1986, 2000; Berman and Case 2012; Environmental Information Association – unknown date; World Health Organization 2006). Some evidence suggests that chrysotile asbestos may present less long-term health risk related to exposure than do asbestiform minerals in the amphibole group, but to date this is not a generally accepted conclusion (Bernstein and Hoskins 2006, Berman and Crump 2008a, Gibbs and Berry 2008).

The forest has followed the regional forester direction outlined in a letter dated February 11, 2009, regarding the addition of roads and trails to the NFTS that may contain NOA. The letter states: “Any land management decisions regarding NOA must be based on sound data and analysis. According to EPA, the scientific assessment and identification of actual public health risks associated with NOA is a complex and time intensive process. Until such studies are performed, the Region will not have definitive information regarding actual employee and public health risks posed by NOA on national forest lands. Therefore, no decisions are being made or direction issued at this point in time to restrict or alter public access to and/or recreational use of the national forests.”

The letter further directs forests to make the public aware of the potential risk of exposure to natural asbestos and its potential presence on national forest lands as well as guidance on how visitors can reduce their exposure to the substance. This has been accomplished with a fact sheet addressing natural asbestos hazards, available on the web at *www.fs.fed.us/r5/noa/*, along with maps showing distribution of asbestos-bearing rock on the forest. Both are available to the public in the forest supervisor’s office, as well as in district offices.

The forest conducted laboratory testing of UAR surfaces for the presence of asbestos. In most cases, more than one sample was taken per route. Twenty-seven UAR segments proposed for designation in the NFTS on the Smith River NRA were tested for presence of NOA. The final results of the testing show that three had no detection, 18 had less than 0.25 percent (low) asbestos content, and six had greater than or equal to 0.25 percent (high) asbestos content (ERRG 2011) (Figure 3-3). No tests have been conducted on the 24 other UARs proposed for designation in the NFTS. Figure 3-3 characterizes the distribution of ultramafic rock and the asbestos test results.

The forest currently manages and maintains 370 miles of roads of the NFTS in an open, drivable condition in the analysis area. There are 86 miles of ML 1 (closed roads considered in storage) in the present road system, for a total length of all NFTS roads equaling 456 miles. There are also 12 miles of motorized trails authorized for use. One hundred forty-one miles of UARs have been inventoried in the area. There are currently no passenger car roads (ML 3 and above) designated for mixed use (highway- and non-highway-legal vehicles both permitted) in the area. The following table (Table 3-36) describes the total distance in miles of each of these types of motor vehicle route by the two geo-indicator metrics listed above (miles of road or route located on mapped dormant or active landslides; miles of road or route located on mapped ultramafic rock).

Table 3-36. Mileage and percentage of total mileage by route type and geo-indicator.

Route Type	Total Mileage	Mileage on Mapped Landslides	Percent of Total Mileage on Mapped Landslides	Mileage on Ultramafic Bedrock	Percent of Total Mileage on Ultramafic Bedrock
NFTS Level 1	85.9	20.3	23.6%	25.2	29.3%
NFTS Level 2-5	370.4	72.4	19.6%	117.5	31.7%
Motorized Trail	12.3	1.0	8.1%	8.1	65.9%
UARs	141.2	51.0	36.1%	97.8	69.3%
All Routes	609.8	144.7	23.7%	248.7	40.8%

It is evident from Table 3-36 that a substantial portion of the transportation system in the analysis area has slope stability and/or asbestos hazard risk based on the geo-indicators. The asbestos hazard geo-indicator is more prevalent than the slope stability geo-indicator by nearly a factor of two. It is also evident that for both geo-indicators, the overall amount of risk as indicated by the selected metrics is higher on UARs as compared to NFTS routes maintained for highway vehicles.

The level of risk for slope instability is mitigated to an extent by several factors. Most landslide terrain is dormant, or if mapped as active, is only episodically active following major storms and other disturbance events such as wildfire. The bulk of landslide activity occurs during the wet winter season when road system usage is light, and many roads are closed seasonally. Therefore, the direct risk from slope failure to motorists is generally low. Slope instability affects the transportation network most by disruption of road network continuity when landslides are activated, potentially rendering portions of the transportation system inaccessible until repairs can be performed.

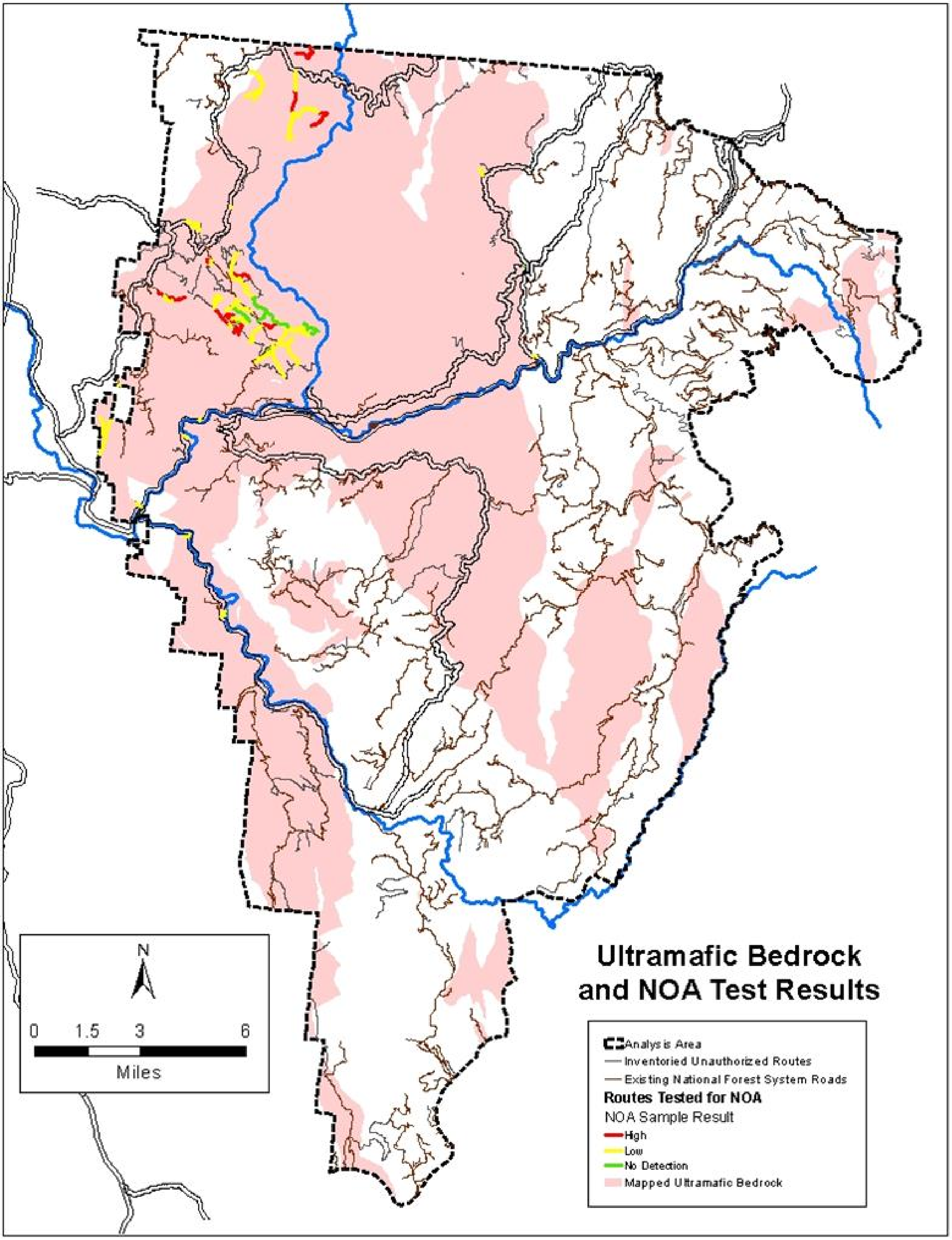

Figure 3-3. Ultramafic bedrock distribution and naturally occurring asbestos test results.

With regard to hazard from exposure to NOA, as measured by route mileage on ultramafic bedrock, it is evident that the risk on motorized trails and UARs is approximately double the risk on the remainder of the transportation system. The ratio of exposure risk between these route types is probably actually even greater, given that: 1) almost all OHV routes are native-surfaced, while developed roads may be surfaced with materials such as chip-seal, oil or non-ultramafic rock; and 2) OHV riders are more likely to be exposed to airborne dust generated from route surfaces due to the unenclosed nature of these types of vehicles. As noted above, however, the actual degree of risk of exposure to NOA related to dust generated from ultramafic bedrock is not well defined or quantified at this time, and potential exposure cannot be translated directly to increased health risk. Therefore, while it appears valid to state that there is increased risk of exposure to NOA on motorized trails and UARs compared to NFTS roads, the actual degree of risk is difficult to quantify. See *Transportation* section under public safety for more information.

Geologic Risk

The indicators in the above table can be summarized into risk categories. Geologic risk ratings represent a combination of potential environmental impacts and risk to the public from hillslope failure, and risk of exposure to NOA. A summary of geologic risk is presented in Table 3-37. Risk categories are as follows:

- A low geologic risk route is not on landslide terrain, and it is not on bedrock, which may contain NOA.
- A moderate geologic risk route is located on dormant landslide terrain. It is not on active landslides nor is it on bedrock, which may contain NOA.
- A high geologic risk route is located on active landslides, and/or on bedrock, which may contain NOA.

Table 3-37 shows that substantial levels of geologic risk are present on roads and routes in the analysis area, based on the defined risk categories. Similarly, to the analysis by geo-indicator, geologic risk is much higher on motorized trails and UARs compared to NFTS roads. The same mitigating factors for slope stability apply to this analysis as well. The overall higher risk on motorized trails and UARs can be seen as an expected outcome, given 1) the area has a high incidence of the geo-indicators of risk; 2) the NFTS, unlike the UAR network, was engineered and constructed to avoid hazardous terrain where possible in order to reduce safety risks and provide for easier, less expensive maintenance; and 3) OHV routes are preferentially situated to provide a user experience that includes steep terrain and unobstructed vistas, characteristics, which reflect less stable slopes and also less heavily vegetated areas that are typical of ultramafic bedrock and soils.

Table 3-37. Mileage and percentage of total mileage by route type and geologic risk category.

Risk		Low		Moderate		High	
Route Type	**Total Mileage**	**Mileage**	**Percent**	**Mileage**	**Percent**	**Mileage**	**Percent**
NFTS Level 1	85.9	46.3	53.9%	14.2	16.5%	25.4	29.6%
NFTS Level 2-5	370.4	207.1	55.9%	44.9	12.1%	118.4	32.0%
Motorized Trail	12.3	3.5	28.1%	0.7	5.9%	8.1	66.0%
UARs	141.2	30.3	21.5%	12.4	8.8%	98.4	69.7%
All Routes	609.8	287.2	47.1%	72.2	11.8%	250.3	41.0%

Comparison of the geo-indicator analysis displayed in Table 3-36 with the geologic risk analysis displayed in Table 3-37 shows that the two analyses show similar results in describing the existing condition. The total road and route mileage that is positive for one or both geo-indicators is also reflected in the total mileage that is in the high geologic risk category. For the remainder of the alternative analyses, the geo-indicator analysis method is employed.

Environmental Consequences

This section discloses the environmental effects of each of the alternatives as described by the selected geo-indicators, namely 1) slope stability hazard as measured by the total mileage of the proposed transportation network located on mapped landslides; and 2) asbestos hazard as measured by the total mileage of the proposed transportation network located on ultramafic bedrock. The four discrete actions analyzed in each of the alternatives are: 1) the designation of facilities (UARs, trails, and/or areas) in the NFTS; 2) changes to road maintenance status, vehicle class and season of use; 3) decommissioning of existing NFTS roads; and 4) restoration of drainage patterns on UARs. The types of environmental effects associated with each of the geo-indicators are discussed above in the *Indicators* and *Existing Condition* sections. All direct and indirect effects are analyzed and discussed with respect to the selected geo-indicators and the four types of proposed activities for each alternative.

The additional proposed activity of replacing the Griffin Creek Bridge is analyzed in a separate section following the analyses of the other road-related activities for each alternative. The same geo-indicators are discussed with respect to the bridge replacement.

Alternative 1 – No Action – Direct and Indirect Effects

Under this alternative, no changes would be made to the existing NFTS. Current management plans would continue to guide project area management. Unauthorized routes would continue to have no status as NFTS facilities and drainage patterns would not be restored. The current MVUM would continue to provide direction on motorized use on NFTS roads and motorized trails in the analysis area. None of the four types of proposed actions described above would occur. The same trends in geologic conditions related to the existing transportation system and UAR network would continue, at the same or possibly increased levels of risk. An overall increase in risk is likely because as noted in the Transportation Facilities chapter, maintenance backlogs related to budget shortfalls would likely continue, allowing slope instability and NOA hazards to go unabated and potentially increase risk to users and to the roads and routes.

Table 3-38 summarizes the effects analysis of Alternative 1, as described by changes in each geo-indicator as compared to the existing condition.

As there are no changes to the existing NFTS and no UARs would be added to the NFTS under Alternative 1, there would be no measurable change in either of the geo-indicators for this alternative. As noted above, slope stability and asbestos exposure hazards would remain the same or on similar trends as compared to the existing condition, and might possibly increase as use continues in light of a persistent maintenance backlog.

Table 3-38. Changes in geo-indicators by miles and percentage for Alternative 1 compared to the existing condition.

Action	Geo-Indicator	Change from Existing Condition (Miles)	Percent Change from Existing Condition
Designation as NFTS Routes	Slope Stability	0	0%
	Asbestos Hazard	0	0%
	Combined	0	0%
Changes to NFTS	Slope Stability	0	0%
	Asbestos Hazard	0	0%
	Combined	0	0%
Road Decommissioning	Slope Stability	0	0%
	Asbestos Hazard	0	0%
	Combined	0	0%
Route Restoration	Slope Stability	0	0%
	Asbestos Hazard	0	0%
	Combined	0	0%
Total of All Actions	Slope Stability	0	0%
	Asbestos Hazard	0	0%
	Combined	0	0%

Alternative 2 – Original Proposed Action

Alternative 2, the original proposed action, was dropped from detailed consideration because as described in Chapter 2 (*Description of Alternatives*) it exceeded the scope of analysis for the current project area. Therefore, no analysis of Alternative 2 will be presented here.

Alternative 4

Table 3-39 summarizes the effects analysis of Alternative 4, as described by changes in each geo-indicator as compared to the existing condition. Note that the mileage and percentage changes calculated for each geo-indicator category do not sum to the calculated combined totals, because of overlap between facilities co-located on landslide terrain and ultramafic bedrock.

Table 3-39. Changes in geo-indicators by miles and percentage for Alternative 4 compared to the existing condition.

Action	Geo-Indicator	Change from Existing Condition (Miles)	Percent Change from Existing Condition
Designation as NFTS Routes	Slope Stability	29.4	31.4%
	Asbestos Hazard	58.5	38.8%
	Combined	58.9	27.8%
Upgrading and Downgrading of Roads (ML 1 and 2)	Slope Stability	N/A[24]	N/A
	Asbestos Hazard	-0.6	-0.4%
	Combined	-0.6	N/A
Road Decommissioning	Slope Stability	-12.4	-13.2%
	Asbestos Hazard	-8.7	-5.8%
	Combined	-18.6	-8.8%
Restoration of Drainage Patterns on UARs	Slope Stability	-20.1	-39.3%
	Asbestos Hazard	-35.0	-35.8%
	Combined	-42.4	-38.2%
Total of All Actions	**Slope Stability**	**-3.0**	**-2.1%**
	Asbestos Hazard	**14.2**	**5.7%**
	Combined	**-2.7**	**-0.9%**

Alternative 4 – Direct and Indirect Effects

Alternative 4 would measurably increase the geo-indicators for slope stability risk and asbestos exposure for designation as NFTS routes, and would measurably decrease the geo-indicators for slope stability risk and asbestos exposure hazard for each other type of action.

As discussed above (in *Effects Analysis Methodology by Action*), proposed mitigations would likely reduce the risk defined by the geo-indicators to an unknown extent. The effects of changes in maintenance levels (opening or closing roads) cannot be readily measured for the geo-indicator of slope stability. These changes would have a small measurable benefit (decrease) in the geo-indicator for asbestos exposure.

It is apparent that under this alternative, system road decommissioning would bring about a substantial reduction (benefit) in the geo-indicators for slope stability, asbestos hazard and combined hazard, and a parallel but greater reduction in each indicator would result from restoration of drainage patterns on UARs not designated to the NFTS. The overall level of risk across the analysis area would change little from the existing condition when the risk increase from route designation is weighed against the risk reduction from decommissioning and restoration, although there would be a measurable overall increase in the geo-indicator for asbestos exposure.

Under Alternative 4, all UARs not designated as NFTS routes would be barricaded. The degree of risk related to slope instability and asbestos exposure on these routes would be comparable to Alternatives 5 and 6.

[24] See below and also the *Effects Analysis Methodology by Action* section for explanation of why effects of changes to the maintenance levels and vehicle class on slope stability, or the effects of seasonal closures and mixed-use designation on either geo-indicator, were not analyzed quantitatively.

Stormproofing proposed on existing system roads should further enhance slope stability by directing drainage away from unstable areas and from diversion to stream channels, reducing the risk of hillslope, road/stream crossing and stream bank failure. Alternative 4 provides the highest mileage of stormproofing of all of the alternatives; consequently, it would also potentially enhance overall slope stability the most.

The designation of five parking areas adjacent to Forest Road 17N49 might increase asbestos exposure hazard, since they would be located on a popular OHV route network on Gasquet Mountain, where there is a high degree of ultramafic bedrock exposure and several routes that tested high for asbestos presence. This is also the proposed location for designation of mixed use on 17N49. Exposure might increase related to designation of the parking areas and mixed use, concentrating vehicle activity and thereby increasing dust generation and exposure. These sites would be suitable locations for posting information about the presence of ultramafic bedrock, potential NOA presence, exposure and hazards, as described in the *Description of Alternatives* (Chapter 2) and in the *Geologic Hazards – Naturally Occurring Asbestos* section of this chapter.

Alternative 5

Table 3-40 summarizes the effects analysis of Alternative 5, as described by changes in each geo-indicator as compared to the existing condition. Note that the mileage and percentage changes calculated for each geo-indicator category do not sum to the calculated combined totals, because of overlap between facilities co-located on landslide terrain and ultramafic bedrock.

Table 3-40. Changes in geo-indicators by miles and percentage for Alternative 5 compared to the existing condition.

Action	Geo-Indicator	Change from Existing Condition (Miles)	Percent Change from Existing Condition
Designation as NFTS Routes	Slope Stability	3.9	4.2%
	Asbestos Hazard	8.8	5.8%
	Combined	11.4	5.4%
Upgrading and Downgrading of Roads (ML 1 and 2)	Slope Stability	N/A[25]	N/A[a]
	Asbestos Hazard	-14.1	-9.4%
	Combined	-14.1	N/A
Road Decommissioning	Slope Stability	-26.3	-28.0%
	Asbestos Hazard	-32.1	-21.3%
	Combined	-48.0	-22.7%
Restoration of Drainage Patterns on UARs	Slope Stability	-47.1	92.3%
	Asbestos Hazard	-89.0	87.7%
	Combined	-99.5	91.0%
Total of All Actions	***Slope Stability***	***-69.4***	***-48.0%***
	Asbestos Hazard	***-126.4***	***-50.8%***
	Combined	***-136.1***	***-43.3%***

[25] See below and also the *Effects Analysis Methodology by Action* section for explanation of why effects of changes to the maintenance levels and vehicle class on slope stability, or the effects of seasonal closures and mixed-use designation on either geo-indicator, were not analyzed quantitatively.

Alternative 5 – Direct and Indirect Effects

Alternative 5 would also measurably increase the geo-indicators for slope stability risk and asbestos exposure for designation as NFTS routes, but to a much lesser degree than Alternative 4, and would measurably decrease the geo-indicators for slope stability risk and asbestos exposure hazard for each other type of action, to a greater degree than Alternative 4.

As discussed above (in *Effects Analysis Methodology by Action*), proposed mitigations would likely reduce the risk defined by the geo-indicators to an unknown extent. The effects of changes in maintenance levels (opening or closing roads) cannot be readily measured for the geo-indicator of slope stability. Unlike Alternative 4, under Alternative 5 these changes would have a substantial measurable benefit to (decrease in) the geo-indicator for asbestos exposure, due to the much greater road mileage proposed for closure (downgrade to ML 1) under this alternative.

It is apparent that under this alternative, system road decommissioning would bring about a substantial reduction (benefit) in the geo-indicators for slope stability, asbestos hazard and combined hazard, and a parallel but greater reduction in each indicator would result from restoration of drainage patterns on UARs not designated to the NFTS. The benefit from road decommissioning would be greater than Alternative 4. The benefit from route restoration would also be measurably greater compared to Alternative 4. With net reductions in the geo-indicators approaching 90 percent, this alternative would come the closest of any of the alternatives analyzed to fully mitigating the risks associated with slope instability and asbestos exposure on currently UARs. While the reductions in the geo-indicator metrics do not necessarily equate to linear ratios of risk reduction, it is evident that this alternative reduces both slope stability hazard and asbestos hazard substantially, especially through the restoration of UARs, to a greater extent than any of the other alternatives analyzed.

Under Alternative 5, all UARs not designated as NFTS routes would be barricaded when off an open road or trail. The degree of risk related to slope instability and asbestos exposure on these routes would be comparable to Alternatives 4 and 6.

Drainage improvements (stormproofing) proposed on existing system roads should further enhance slope stability by directing drainage away from unstable areas and from diversion to stream channels, reducing the risk of hillslope, road/stream crossing and stream bank failure. Fewer miles stormproofed in this alternative (80 miles compared to 128 miles in Alternative 4 and 127 miles in Alternative 6) would potentially enhance overall slope stability to a lesser degree; however, many of the roads that would be storm-proofed under other alternatives would be closed (downgraded to ML 1) and treated to achieve a free-draining state under Alternative 5. Consequently, the overall difference in slope stability risk between Alternative 5 and other alternatives related to drainage improvements is probably small.

The designation of one parking area adjacent to Road 17N49 may slightly increase asbestos exposure hazard, since it would be located on a popular OHV route network on Gasquet Mountain, where there is a high degree of ultramafic bedrock exposure and several routes that tested high for asbestos presence. This is also the proposed location for designation of mixed use on Road 17N49. Exposure might increase related to designation of the parking area and mixed use, concentrating vehicle activity and thereby increasing dust generation and exposure. This would be a suitable location for posting information about the presence of ultramafic bedrock, potential NOA presence, exposure and hazards, as described in the *Description of Alternatives* (Chapter 2) and in the *Geologic Hazards –Naturally Occurring Asbestos* section of this chapter.

Alternative 6

Table 3-41 summarizes the effects analysis of Alternative 6, as described by changes in each geo-indicator as compared to the existing condition. Note that the mileage and percentage changes calculated for each geo-indicator category do not sum to the calculated combined totals, because of overlap between facilities co-located on landslide terrain and ultramafic bedrock.

Table 3-41. Changes in geo-indicators by miles and percentage for Alternative 6 compared to the existing condition.

Action	Geo-Indicator	Change from Existing Condition (Miles)	Percent Change from Existing Condition
Designation as NFTS Routes	Slope Stability	21.7	23.1%
	Asbestos Hazard	44.4	29.4%
	Combined	49.7	23.5%
Upgrading and Downgrading of Roads (ML 1 and 2)	Slope Stability	N/A[26]	N/A[a]
	Asbestos Hazard	-2.0	-1.3%
	Combined	-2.0	N/A
Road Decommissioning	Slope Stability	-12.4	-13.3%
	Asbestos Hazard	-8.7	-5.8%
	Combined	-18.6	-8.8%
Restoration of Drainage Patterns on UARs	Slope Stability	-29.4	-57.6%
	Asbestos Hazard	-53.5	-54.7%
	Combined	-61.2	-55.2%
Total of All Actions	**Slope Stability**	**-20.1**	**-13.9%**
	Asbestos Hazard	**-19.9**	**-8.0%**
	Combined	**-30.2**	**-9.6%**

Alternative 6 – Direct and Indirect Effects

Alternative 6 would also measurably increase the geo-indicators for slope stability risk and asbestos exposure for route additions to the NFTS, to a slightly lesser extent than Alternative 4, and would measurably decrease the geo-indicators for slope stability risk and asbestos exposure hazard for changes in maintenance level and restoration of UARs, to a greater degree than Alternative 4, but less than Alternative 6. The geo-indicators for road decommissioning would be essentially equal to those for Alternative 4.

As discussed above (in *Effects Analysis Methodology by Action*), proposed mitigations would likely reduce the risk defined by the geo-indicators to an unknown extent. The effects of changes in maintenance

[26] See below and also the Effects Analysis Methodology by Action section for explanation of why effects of changes to the maintenance levels and vehicle class on slope stability, or the effects of seasonal closures and mixed-use designation on either geo-indicator, were not analyzed quantitatively.

levels (opening or closing roads) cannot be readily measured for the geo-indicator of slope stability. Proposed changes in maintenance levels would have a small measurable benefit (decrease) in the geo-indicator for asbestos exposure. The effects of designation of mixed use and changes in season of use were not analyzed quantitatively, as they are not easily quantified.

It is apparent that under this alternative, system road decommissioning would bring about a substantial reduction (benefit) in the geo-indicators for slope stability, asbestos hazard and combined hazard, and a parallel but much greater reduction in each indicator would result from restoration of drainage patterns on UARs not designated to the NFTS. The benefit from road decommissioning would be comparable to Alternative 4, but not as great as Alternative 5. The benefit from route restoration would be greater than Alternative 4, but less than Alternative 5. While the reductions in the geo-indicator metrics do not necessarily equate to linear ratios of risk reduction, it is evident that this alternative reduces both slope stability hazard and asbestos hazard substantially, especially through the restoration of UARs.

Under Alternative 6, all UARs not designated as NFTS routes would be barricaded when off an open road or trail. The degree of risk related to slope instability and asbestos exposure on these routes would be comparable to Alternatives 4 and 5.

Drainage improvements (stormproofing) proposed on existing system roads should further enhance slope stability by directing drainage away from unstable areas and from diversion to stream channels, reducing the risk of hillslope, road/stream crossing and stream bank failure.

The designation of four parking areas adjacent to Road 17N49 may increase the geo-indicator metric for asbestos hazard, since they would be located on a popular OHV route network on Gasquet Mountain, where there is a high degree of ultramafic bedrock exposure and several routes that tested high for asbestos presence. Exposure might increase related to designation of the area, concentrating activity and thereby increasing dust generation and exposure. These sites would be suitable locations for posting information about the presence of ultramafic bedrock, potential NOA presence, exposure and hazards, as described in the *Description of Alternatives* (Chapter 2) and in the *Geologic Hazards – Naturally Occurring Asbestos* section of this chapter.

Alternatives 4, 5, and 6 – Griffin Creek Bridge Replacement

As a separate action incorporated in each of the actions alternatives analyzed in detail, it is proposed to replace the Griffin Creek Bridge on Forest Road 18N07 at MP 0.0, at its junction with US Highway 199. The bridge has a cracked and failing support girder, and is unsafe for vehicle passage at its full design load rating. The effects of this proposed bridge replacement are analyzed below with respect to each geo-indicator. All geotechnical information is derived from the geotechnical review submitted to the Forest Service for the purposes of the bridge replacement proposal (MGE Engineering 2015).

Site Conditions and Design Factors

The existing bridge is supported by two concrete abutments on either bank of Griffin Creek, with a mid-span pier support. Twin spread footings embedded into bedrock support each abutment; a single spread footing supports the pier. Three glue-laminated wooden girders support the concrete bridge deck. The southern, downstream-most girder is cracked, compromising the structural integrity and load capacity of the bridge (Dumlao, personal communication, 2015).

Bedrock at the site is Galice Formation, meta-shale to slate in texture, and is highly foliated, with abundant weathering and parting where exposed. Jointing is variable, ranging from 0.5 to ten inches typically, with 1- to 2-foot joint spacing where the rock is more massive. Foliar structure dips moderately to steeply east to southeast. The rock below the observed weathering depth is competent, and passed laboratory testing for point loading and compressive strength. Minimal scour was observed at the pier footing. The existing abutment setbacks appear to provide adequate protection from long-term scour during high-flow periods. Slope instability at the site appears minimal, given the observed competence of the steep bedrock banks at the site. No active or dormant landsliding is mapped or evident at the site.

Seismic modeling was conducted to estimate the likely seismic shaking intensity at the site based on the CalTrans specifications for the area. The maximum design earthquake used for deterministic modeling was an 8.3 Mm (moment magnitude) earthquake on the Cascadia Subduction Zone (CSV). A probabilistic controlling spectrum equivalent to a 5 percent in 50-year (975-year) recurrence interval event was also modeled. Based on this, design parameters were selected to protect the bridge structure from failure in the event of the design event. The bridge design factors include: 1) a CSV earthquake of 8.3 Mm; 2) a local shear wave velocity of 560 meters per second based on a conservative assumption of dense soil/soft rock in the upper 100 feet of the soil profile; and 3) a peak ground acceleration of 0.313g.

The proposed replacement bridge design would eliminate the mid-span pier support, replacing the existing two-span bridge deck with a single-span superstructure. Demolition of the existing structure, with the exception of the bridge rail, would occur prior to installation of the new footings, girders and bridge deck. New center footings would be placed between the sites of the existing spread footings on both abutments. Three steel girders would be placed across the span prior to pouring the new concrete bridge deck and re-installing the railing.

Direct and Indirect Effects

Given the observed stability and load-bearing capacity of the bedrock at the proposed sites for the abutments and footings, there appears to be minimal risk of slope instability at the site affecting bridge or roadway structural integrity or streambank slope stability. This assumes design specifications and standards, including standard engineering construction practices are followed, including a sufficient depth of embedment of the footings into bedrock, and adequate setback of the abutments and footings from the active stream channel. Elimination of the mid-span pier should reduce the potential for scour affecting the structure or banks. Consequently, the proposed Griffin Creek bridge replacement is considered to have negligible effects to minor positive effects with respect to the geo-indicator of slope stability.

As the bedrock at the bridge site is not ultramafic, there is considered to minimal risk of asbestos exposure related to construction, maintenance or use of the proposed replacement bridge.

This effects analysis applies to the bridge replacement proposal for all action alternatives analyzed (Alternatives 4, 5 and 6).

Summary of Effects Analysis across All Alternatives

Table 3-42 is a summary of each alternative, and action, by geo-indicator. For all actions, the alternative with the least number of cumulative miles per geo-indicator would have the smallest potential impact on the terrain and/or least potential hazard to human health. Based on this, the alternatives are ranked. A higher rank (5) indicates more benefits and/or less adverse effects to geologic resources and hazards for a given alternative, and a lower rank (1) indicates fewer benefits and/or most adverse effects, based on the geo-indicators. The scores are then averaged across the indicators to generate a final scoring rank for the alternatives. Two ranking schemes are displayed; one is based on averaging all hazard indicators for each action by alternative; the second is based only on averaging the combined hazard indicators.

Table 3-42. Change in miles from the existing condition, and rank by geo-indicator for each action by alternative.[27]

Geo-Indicator	Alternative 1	Alternative 4	Alternative 5	Alternative 6
Action – Designation as NFTS Routes				
Slope Stability	0 miles (4)	29.4 (1)	3.9 (3)	21.7 (2)
Asbestos Hazard	0 miles (4)	58.5 (1)	8.8 (3)	44.4 (2)
Combined Hazard	0 miles (4)	58.9 (1)	11.4 (3)	49.7 (2)
Action – Upgrading and Downgrading of Roads (ML 1 and 2)				
Slope Stability	0 miles (1)	N/A	N/A	N/A
Asbestos Hazard	0 miles (1)	-0.6 (2)	-14.1 (4)	-2.0 (3)
Combined Hazard	0 miles (1)	-0.6 (2)	-14.1 (4)	-2.0 (3)
Action – Road Decommissioning				
Slope Stability	0 miles (1)	-12.4 (2)	-26.3 (4)	-12.4 (2)
Asbestos Hazard	0 miles (1)	-8.7 (2)	-32.1 (4)	-8.7 (2)
Combined Hazard	0 miles (1)	-18.6 (2)	-48.0 (4)	-18.6 (2)
Action – Restoration of Drainage Patterns on UARs				
Slope Stability	0 miles (1)	-20.0 (2)	-47.1 (4)	-29.4 (3)
Asbestos Hazard	0 miles (1)	-35.0 (2)	-89.0 (4)	-53.5 (3)
Combined Hazard	0 miles (1)	-42.4 (2)	-99.5 (4)	-61.2 (3)
Geology – Cumulative Ranking by All Hazards				
Overall Rank	1.75 (2)	1.73 (1)	3.73 (4)	2.45 (3)
Geology – Cumulative Ranking by Combined Hazards Only				
Overall Rank	1.75 (1)	1.75 (1)	3.75 (4)	2.50 (3)

Based on the rankings in Table 3-42, Alternative 4 is slightly less beneficial than Alternative 1, the No Action alternative, in terms of potential slope instability and risk of exposure to NOA, as well as overall risk as ranked by the geo-indicators for each action. It therefore has the highest risk, both to watershed resources and human health, from a geologic perspective. Alternative 5 would provide the most potential benefit as described by the geo-indicators for each action, according to both ranking schemes. Alternative 6 would be second best in terms of potential benefit based on these factors. While the numerical scales and

[27] Ranking of each geo-indicator and combined hazard class for each action. For each action, a rank of 4 for the hazard class equals the most benefit/least adverse effect for that alternative; a rank of 1 equals the least benefit/most adverse effect for that alternative. The cumulative ranking is the mean of the combined hazard classes for all alternatives.

rankings cannot be interpreted as linear indications of differences in risk, it appears that while Alternative 5 provides the most potential overall benefit from a geologic perspective, Alternative 6 provides substantially lower benefit (higher risk) and is closer to Alternative 4 in terms of overall benefit/risk.

Alternatives 4 and 6 are very similar in the mileage of road that would be decommissioned, and so are essentially identical in their geo-indicator metrics for decommissioning. Alternative 5 provides much greater benefit with respect to the road decommissioning metrics compared to the other alternatives analyzed. The bulk of the difference in potential benefits between Alternatives 4 and 6 is reflected in the mileage of UARs that would be designated in the NFTS, and in the mileage of restoration of routes not designated that each would achieve. In this regard, Alternative 5 provides by far the most potential benefit. In addition, Alternative 5 is the only alternative that provides substantial potential benefit in terms of reduction in risk from asbestos exposure related to modification of the existing in the NFTS, because of the relatively large number of miles of roads proposed for closure (downgrade to ML 1) under this alternative.

Compliance with the Forest Plan and other Direction

A list of BMPs that apply to this project are included in Appendix D of the FEIS. Also, see the *Riparian Reserves Management Area* direction for information on the NWFP ACS. Mitigation measures such as culvert upgrades, waterbars, and rolling dips (included in Alternatives 4, 5 and 6) have been proposed in order to comply with the Forest Plan and Clean Water Act. In addition, frequent monitoring and maintenance will be needed in order to meet water quality related Standards and Guidelines (see Appendix B Monitoring Plan).

Under Alternative 1, existing UARs in the analysis area would remain in their existing unmaintained condition, and NFTS roads would not receive the recommended treatments to mitigate risks and hazards. Water quality issues as well as slope stability and asbestos exposure hazards would remain unmitigated and unacknowledged. The same trends in geologic conditions related to the existing transportation system and UAR network would continue, at the same or possibly increased levels of risk. Recovery would be impeded and existing risks to water quality, the transportation network and human health would continue unabated.

Alternatives 4, 5, and 6 are consistent with Forest Plan direction, standards, and guidelines. National Forest Transportation System roads and proposed routes would be mitigated to comply with direction on erosion prevention, slope stability, water quality protection, and human health hazards.

Earthflows and unstable lands are within riparian reserve boundaries. Alternatives 4, 5, and 6 propose designating routes on unstable terrain. These routes therefore, fall under ACS standards and guidelines, which mandate trails and roads within riparian reserves, do not prevent the attainment of the ACS objectives. Improving drainage structures, continued maintenance, and monitoring for signs of instability would ensure the ACS objectives would be maintained or improved.

Heritage Resources

Introduction

In 1966, Congress declared it to be our national policy that the federal government "administer federally owned, administered, or controlled prehistoric and historic resources in a spirit of stewardship for the inspiration and benefit of present and future generations" (National Historic Preservation Act (NHPA) (16 USC 470-1(3)). This need was made more explicit when the NHPA was amended in 1980 and §110 was added to expand and underscore federal agency responsibility for identifying and protecting historic properties and avoiding unnecessary damage to them. Many historic properties are fragile, and once damaged or destroyed they cannot be repaired or replaced.

Section 106 of the NHPA compels federal agencies to take into account the effect of its undertakings on any district, site, building, structure, or object that is included in or eligible for inclusion in the National Register of Historic Places (NRHP; 36 CFR 60; i.e. historic properties). The Travel Management Rule requires that the effects on cultural resources be considered, with the objective of minimizing damage, when designating roads, trails, and areas for motor vehicle use on national forest lands (36 CFR 212.55(a), 212.55(b)(1)).

Analysis Framework: Statute, Regulation, Forest Plan, and Other Direction

The Forest Service is directed to identify, evaluate, treat, protect, and manage historic properties by several laws. The NHPA of 1966, as amended (16 USC 470 et seq.), provides comprehensive direction to federal agencies about their historic preservation responsibilities. Executive Order 11593, *Protection and Enhancement of the Cultural Environment*, also includes direction about the identification and consideration of historic properties in federal land management decisions.

The NHPA extends the policy in the Historic Sites Act of 1935 (49 Stat. 666; 16 USC 461-467) to include resources that are of state and local significance, expands the National Register of Historic Places (NRHP), and establishes the Advisory Council on Historic Preservation (ACHP) and State Historic Preservation Officers (SHPOs). The NHPA §106 directs all federal agencies to take into account effects of their undertakings (actions, financial support, and authorizations) on properties included in or eligible for the National Register. The ACHP's regulations (36 CFR 800) implement NHPA §106. The NHPA §110 sets inventory, nomination, protection, and preservation responsibilities for federally owned historic properties.

The Forest Service's policy for compliance with §106 of the NHPA in travel management with respect to route designation for motor vehicle use was issued in 2005: *USDA Forest Service Policy for §106 of the NHPA Compliance in Travel Management: Designated Routes for Motor Vehicle Use*. This policy was developed in consultation with the ACHP. It outlines minimal requirements for considering possible effects to historic properties that may be associated with designating routes and areas as part of a national forest's transportation system. This policy statement recognizes that forests with programmatic agreements for compliance with §106 of the NHPA will follow the terms of those agreements.

Section 106 of the NHPA and the ACHPs implementing regulations, Protection of Historic Properties (36 CFR Part 800), require that federal agencies take into account the effect of their undertakings on historic properties, and that agencies provide the ACHP with an opportunity to comment on those undertakings. Programmatic agreements (36 CFR 800.14(b)) provide alternative procedures for complying with 36 CFR 800. Region 5 has two such agreements that are used to analyze effects resulting from travel management projects: 1) the *Programmatic Agreement Among the USDA Forest Service, Pacific Southwest Region, USDA Forest Service, Intermountain Region's Humboldt-Toiyabe National Forest, California State Historic Preservation Officer, and Advisory Council on Historic Preservation Regarding the Process for Compliance with §106 of the National Historic Preservation Act for Designating Motor Vehicle Routes and Managing Motorized Recreation on the National Forests in California* (2006, Motorized Recreation PA); and 2) the *Programmatic Agreement Among the USDA Forest Service, Pacific Southwest Region (Region 5), California State Historic Preservation Officer, Nevada State Historic Preservation Officer, and the Advisory Council on Historic Preservation Regarding the Processes for Compliance with §106 of The National historic Preservation Act for Management of Historic Properties by the National Forests of the Pacific Southwest Region* (2013, PA).

These agreements define the *area of potential effect* (APE; 36 CFR 800.4(a)(1)) as "the geographic area or areas within which an undertaking may directly or indirectly cause alterations in the character or use of historic properties, if any such properties exist. The area of potential effect is influenced by the scale and nature of an undertaking and may be different for different kinds of effects caused by the undertaking" (36 CFR §800.16(d)). Both agreements include strategies outlining the requirements for cultural resource inventory, evaluation of historic properties, and effect determinations; they also include protection and resource management measures that may be used where effects possibly would occur.

Executive Order 11593, *Protection and Enhancement of the Cultural Environment*, issued May 13, 1971, directs federal agencies to inventory cultural resources under their jurisdiction, to nominate to the NRHP all federally owned properties that meet the criteria, to use due caution until the inventory and nomination processes are completed, and to assure that federal plans and programs contribute to preservation and enhancement of non-federally owned properties.

In the *Six Rivers National Forest Summary of Direction for Off Highway Vehicles and Travel Management* (McCray and Schultz 2008), the heritage resource management direction derives from the Forest Plan (p. IV-114). It states, "The heritage resource program will be fully integrated with other resource management activities. Cultural resource inventories will precede all activities with the potential to affect heritage resources. All sites located during these inventories will be documented in accordance with Regional standards. The forest management impact to all significant cultural resources will be mitigated, as set forth in the National Historic Preservation Act of 1966".

The Forest Plan cultural resource-specific standards and guidelines are as follows:

- A cultural resources inventory will be completed for any proposed activity that could affect cultural resources. Results of these inventories will be documented in a project specific Cultural Resources Inventory Report (CRIR). A certified archaeological surveyor, archaeologist, or historian will conduct the cultural resource inventory.

- The significance of and effects on inventoried sites will be evaluated by an archaeologist or historian. Consultation with the California SHPO and the ACHP will take place as required.
- Identified cultural resources will be protected from disturbance and artifact theft through the implementation procedures outlined for the National Preservation Act and the Archaeological Resources Protection Act (ARPA).
- Proposed projects with potential to affect local Native American cultural values or contemporary uses, or in locations known as traditional Native American spiritual use areas, will be discussed with a cross-section of the local Indian population and Tribal Governments. These discussions will take place in the early stages of planning and environmental analysis to identify possible mitigation opportunities or alternatives.

Native American Values

Tribal consultation has occurred to ensure that access and protection of traditional use areas is preserved. The forest has maintained government-to-government consultation with federally recognized tribes including the Yurok Tribe, Elk Valley Rancheria and Tolowa Dee-Ni′ Nation since 2005, and has incorporated their concerns into planning efforts designed during all stages of the NEPA and NHPA processes.

The forest recognizes the complex nature that comes with maintaining access to resources for contemporary Native American use, while simultaneously protecting traditional, spiritual, and archaeological values from potentially adverse effects resulting from proposed actions. In this vein, roads can be both beneficial and detrimental to Native American traditional cultural uses. Use of roads, especially by elders, has become an accepted facet of traditional use, and removal of an access road can cause concern among local tribal members. Although many plants used by local Native Americans for basketry and food can be found in many areas of northern California, gatherers will often travel great distances to return to areas where they or their people have traditionally gathered. The availability and quality of materials traditionally used and access to traditional use areas is of great concern to Native Americans.

Conversely, maintenance of access into these areas can also encourage use by other forest users who may utilize areas of cultural importance for recreational purposes. Physical intrusion into contemporary use sites can result in disturbance through noise, disturbance or desecration of sacred objects, and the loss of solitude for prayer or ceremonies. This can lead to conflicting requests for both road access and road restrictions.

The forest manages more traditional cultural properties (TCPs) than any forest in the region and takes its trust responsibilities to local Native American tribes seriously. Because of the complexity of managing TCPs, the geographic scope of the project was modified to exclude these sensitive areas until management plans for the TCPs are in place. Thus, there are no proposed actions in TCPs at this time (Chapter 1, Issue 4). The forest continues to consider how the proposed actions for this project will affect and/or maintain tribal access and traditional uses throughout the entire Smith River NRA.

Framework for Cultural Resources Effects Analysis[28]

The project APE is defined as the road/motorized trail or area corridor and a 30-meter-wide corridor centered on linear motor vehicle features (Motorized Recreation PA Stipulation III (C)). The analysis focused on roads, motorized trails, and areas (dispersed recreation sites) that are either proposed as *additions* to the NFTS or where proposed actions have the potential to impact previously recorded sites.

All cultural resources within the APE, both formally evaluated and determined eligible for inclusion into the NRHP) *and* unevaluated cultural resources, are considered in this analysis. Cultural resources that have been formally determined *not eligible* for the NRHP in consultation with the SHPO through regulatory procedures (36 CFR §60.4; 36 CFR §800) were not analyzed for effects.

One-hundred fifty-nine routes (includes roads, trails and dispersed recreation sites) were surveyed using intensive strategies, in accordance with the PA Stipulation 7 (Identification and Evaluation of Historic Properties), and the Motorized Recreation PA Appendix C (Heritage Resources Strategy), because they are routes that are being considered for *additions* to the national forest road or motorized trail system or where proposed actions have the potential to impact previously recorded sites. Ten new archaeological sites were recorded during this survey and twenty-five previously recorded sites were monitored or re-recorded.

Three-hundred seventy-three routes were not inventoried for cultural resources because they were considered exempt undertakings in accordance with the PA (Appendix D) and Motorized Recreation PA (Appendix A). They are actions that fit a *screened exemptions* category because they are considered low risk with regard to impacting historic properties:

- “Activities whose APE is entirely within obviously disturbed contexts, and the disturbance is such that the presence of historic properties is considered highly unlikely.” Roads that are being proposed for decommissioning and restoration meet this stipulation and the proposed methods of closure will be within existing road prisms.
- “Routine road maintenance and resurfacing where work is confined to previously maintained surfaces, ditches, and culverts where historic properties are not affected because proposed work is clearly within disturbed contexts, and cut and fill slopes where there are no known historic properties.” Roads that have proposed changes to their maintenance levels meet this stipulation.
- “Temporary or long-term closure of roads or UARs involving no new ground disturbance.” Roads with proposed barricades involving no new ground disturbance meet this stipulation.

Effects Analysis Methodology

Assumptions Specific to Cultural Resources Analysis

- Unauthorized, user-created routes and areas have already affected historic properties within route/area prisms.

[28] See Cultural Resource Inventory Report (CRIR) #R2014051011033, Smith River NRA Motorized Travel Management, Addendum 1.

- Under the action alternatives, use will continue at current levels or increase over time on the designated system; similarly, it is assumed that use will decrease over time on routes that are not designated for public use.
- No distinction was made during the analysis between routes described as roads, motorized trails, or UARs or between motorized vehicle classes, as the effects to historic properties were considered similar in scope, extent, and overall impact.
- The Motorized Recreation PA allows for the designation of UARs (roads, motorized trails, and areas) to the NFTS and their use by the public within historic properties provided such use is recommended by a professional archaeologist (i.e. there is no additional impact to the property expected through managed use of the route or area).
- Access to traditional resources and spiritual areas by Native Americans is facilitated when the greatest number of roads are open for use irrespective of use by other public entities.

Data Sources

- Previous cultural resource inventories from the Smith River NRA.
- Cultural Resources Inventory Report R2014051011033, *Cultural Resources Inventory Report, Addendum 1, for the Smith River National Recreation Area Restoration and Motorized Travel Management EIS* (2013), CRIR R2015051000047, *Cultural Resource Inventory Report, Addendum 2, for the Smith River National Recreation Area Restoration and Motorized Travel Management EIS* (2015), and CRIR 05-10-1033, *Motorized Travel Management Plan for the Smith River National Recreation Area* completed in 2008 (McCovey 2009) with additions in 2009 (Keter 2009). These cultural resource reports addressed routes initially identified during a previous planning effort, and proposed changes analyzed for the DEIS and FEIS.
- Existing information from archaeological records, historic archives, maps, and GIS spatial layers.

Cultural Resources Indicators

- Degree to which the integrity of historic property values are being diminished at current use levels. Integrity Measures evaluated include changes to site characteristics such as location, design, setting, materials, workmanship, feeling, and association.
- Number of historic properties within UARs at risk from ongoing use.
- Average number of historic properties per acre at risk if routes are designated on the NFTS.
- Level of access retained to known or unknown tribal use areas through route designation or closure.

Basis for Analysis

Spatial: The location of the historic property is the unit of spatial analysis when considering effects in action alternatives. For some historic properties (e.g., TCP), the setting beyond the historic property's location must also be considered when determining whether an adverse effect will occur.

Effects Timeframes:

- Short-term effects occur within one year.
- Long-term effects occur up to 20 years.
- Cumulative effects occur up to 20 years.

Measurement Indicator and Rationale: When assessing direct, indirect, and cumulative effects, base assessments on a historic property possessing at least one of the following NRHP values (36 CFR 60.4(a – d)) unless specific information already exists:

- Prehistoric archaeological site: Criterion D
- Historic archaeological sites: Criterion D
- Historic structures: Criterion C

Methodology

When assessing effects under §106 of the NHPA, an undertaking can have no effect, no adverse effect, or an adverse effect. Table 3-43 cross references the NEPA effects terminology with §106 effects terminology. In §106, an adverse effect to a historic property can occur when an undertaking directly or indirectly causes alterations in its character or use. An adverse effect on a historic property occurs when an undertaking alters its important characteristics and is measured by the degree to which it diminishes its location, design, setting, materials, workmanship, feeling or association (i.e. integrity measures) (36 CFR 800.5(a)(1)). These integrity measures can also be used to characterize the nature of any potential effects, whether they are direct, indirect or cumulative effects; and their severity, whether they are negligible, minor, moderate, or major. The degree to which historic property values are diminished will be used to measure the direct, indirect and cumulative effects of motorized vehicle use on the NFTS.

Table 3-43. Comparison of effect categories under NEPA and NHPA.

NEPA	NHPA	Severity
None	No Effect	None – Negligible
Direct Effect	No Adverse Effect	Minor – Moderate – Major
	Adverse Effect	Minor – Moderate – Major
Indirect Effect	No Adverse Effect	Minor – Moderate – Major
	Adverse Effect	Minor – Moderate – Major
Cumulative Effect	No Adverse Effect	Minor – Moderate – Major
	Adverse Effect	Minor – Moderate – Major

Effects were analyzed against the project alternatives using the following three categories: 1) type of effect; 2) nature of effect; and 3) severity of effect. The severity of the effect will generally prescribe the type of mitigation measure needed. In accordance with the PA and Motorized Recreation PA there are two possible options for lessening effects to *no adverse effect*: 1) monitoring (Stipulation IV (C)) or 2) the installation of physical barriers (Appendix B (II) (A) (3)). Where there is uncertainty about possible direct or indirect effects to properties within or in proximity to the APE, including *at risk* properties described in the Motorized Recreation PA**,** monitoring may be prescribed. If cumulative effects are identified, consultation with the SHPO under 36 CFR 800 is required to identify any required mitigation measures. Each of the effect categories are defined as follows:

- **Type of Effect:** A direct effect is/will be caused by motorized vehicle uses/or the consequences of such use, including physical damage resulting in or from erosion, down cutting, rutting, or displacement or damage to cultural features.

Indirect effects are associated with motorized vehicle uses but occur outside designated routes, such as adjacent dispersed camping areas or areas where motorized travel off designated routes or areas may occur. The *proximity* of sensitive cultural resources, such as rock art, rock shelters, historic structures, and TCPs, to designated routes or areas is important when determining where resources could be susceptible to greater threats or risks. Indirect effects could include those listed for direct effects, but also include destructive actions like vandalism and looting. Examples of site disturbance from direct and indirect effects are displayed in Table 3-44.

- **Nature of Effect:** These include observations of site disturbance from erosion, down-cutting, rutting, displacement, disturbance, damage, deteriorate, vandalism, looting, removal/alteration of historic structure, visual/audible/atmospheric to historic setting or cultural landscape/TCP.
- **Severity of Effect** (Keter 2010)**:** This includes categories of negligible, minor, moderate and major. A negligible effect is determined when there is no measurable effect on the cultural resource though the route bisects or closely passes by some portions of a cultural resource. A minor effect is determined if the integrity of the cultural resource is affected by certain activities such as camping. Most minor problems are indirect effects. Either signage or monitoring is prescribed to ensure that the minor degree of disturbance (or potential for disturbance) initially noted does not increase in severity over time. A moderate effect is determined if site constituents exhibit some degree of damage or alteration. Site integrity can be retained or improved if the detrimental activity is curtailed. The preferred method to curtail a moderate effect is to erect a barrier. A major effect is determined if the effect on a cultural resource is severe and direct. This is considered an adverse effect to cultural resources and further SHPO consultation under 36 CFR 800 is required. In most cases, the only viable option may be to undesignate or reroute the road/motorized trail. Other mitigation measures may necessitate scientific data recovery.

Table 3-44. Examples of indirect and direct effects to cultural resources (nature of effect).

Indirect	Direct
• Driving off-established routes within archaeological site boundaries. • Designating motorized trail systems to NFTS that are within site boundaries – future potential to effect sites. • Ground disturbance activities associated with motor vehicle camping within archaeological site boundaries that contain significant cultural features. • Motor vehicle camping on an archaeological site where campers looted or otherwise disturbed the site. • Vandalism to historic mine sites accessed by motor vehicle, e.g., bullet holes, theft, and structural damage. • Evidence of vandalism or illicit digging activity.	• Routes cross or ruts have been created that disturb artifacts and features within a prehistoric or historic archaeological site. This results in ground disturbance, erosion and the displacement of artifacts and features.

Cultural Resources Methodology by Action

Action 1. Direct and indirect effects of designating facilities (presently UARs) on the NFTS, including identifying seasons of use and vehicle class.

- **Short-term timeframe:** 1 year.
- **Long-term timeframe:** 20 years.
- **Spatial boundary:** Location of historic property.
- **Indicator(s):** Degree to which the integrity of historic property values are diminished, related to location, design, setting, materials, workmanship, feeling, or association.
- **Methodology:** Information obtained from completed or previously reported archaeological survey of the proposed designated routes. In addition, use of existing data from cultural resource site atlas, site record files, archival files, maps and GIS spatial layers, to identify cultural resources in the APE that may have direct or indirect effects.
- **Rationale:** PA and Motorized Recreation PA.

Action 2. Direct and indirect effects of decommissioning and/or restoring facilities (presently UARs).

- **Short-term timeframe:** 1 year.
- **Long-term timeframe:** 20 years.
- **Spatial boundary:** Location of historic property.
- **Indicator(s):** Degree to which the integrity of historic property values are diminished, related to location, design, setting, materials, workmanship, feeling, or association.
- **Methodology:** Information obtained from completed or previously reported archaeological survey of the routes proposed for decommissioning or restoration. In addition, use of existing data from cultural resource site atlas, site record files, archival files, maps and GIS spatial layers, to identify cultural resources in the APE that may have direct or indirect effects.
- **Rationale:** PA and Motorized Recreation PA.

Action 3. Effects resulting from changes to the existing NFTS (this can include decommissioning of facilities and changing the vehicle class and season of use).

None of these actions is considered an undertaking subject to NHPA §106 compliance (USDA Forest Service Policy for §106 of the NHPA Compliance in Travel Management: Designated Routes for Motor Vehicle Use (2005)). Motorized vehicles can already use NFTS roads. Allowing or prohibiting use of those roads by different types of vehicles will have no direct, indirect, or cumulative effect on cultural resources.

- **Short-term timeframe:** not applicable; cumulative effects analysis will be done only for the long-term timeframe.
- **Long-term timeframe:** 20 years.
- **Spatial boundary:** District boundary (excluding designated wilderness and known TCPs).

- **Indicator(s):** Degree to which the integrity of historic property values are diminished, related to location, design, setting, materials, workmanship, feeling, or association.
- **Methodology:** Use existing data from cultural resource site atlas, historic archives, maps, site record files, and GIS spatial layers, and information obtained from archaeological inventories of UARs, to identify cultural resources in the APE that may have cumulative effects.
- **Rationale:** PA and Motorized Recreation PA.

Affected Environment

There are approximately 238 cultural resources recorded within the Smith River NRA administrative boundaries. Thirty sites are pre-contact, 169 are historic, and 39 are multi-component. Pre-contact Native American activities and ethnographic land use was seasonally based with major villages located along the coast. There are recorded seasonal villages or temporary camps along the river corridors, and sensitive religious and cultural locations including areas used for the collection of traditional botanical resources. Today, Native Americans from a number of Indian tribes including the Tolowa, Yurok, Takelma, and Tutuni still actively use the Smith River NRA for gathering traditional food and medicinal plants, basket weaving materials, for hunting, and conducting ceremonies. The Tolowa are represented by the federally recognized Tolowa Dee-Ni′ Nation (formerly Smith River Rancheria) and Elk Valley Rancheria, and the Yurok by the Yurok Tribe, Resighini Rancheria, and Trinidad Rancheria.

The footprint of pre-contact archaeological sites within the project APE is sparse. These sites, especially at the dispersed recreation locations, may be masked and are not visible on the surface from periodic river flooding, and the overburden from mining, such as mine tailings. The few examples of this site type usually correlate with springs or large river terraces, which there are few within the project.

The vast majority of the recorded sites consist of non-native historic lands use activities, which date from circa 1852 to the present. The principal historic land use within the project is related to the exploration for and mining of gold and copper, beginning circa 1852 (Keter 1995:20). The mining for chromite came to the project area a decade later in the 1860s (Heffner 1984:43). Mining continued its boom and bust cycle into the 1980s. Some of the roads and UARs now in the project were originally built to reach these mines. Clusters of mines around Coon Mountain, the High Divide/Low Divide area, Rattlesnake Mountain, Big Flat, French Hill, Diamond Creek, Myrtle Creek, and the Monumental area seem to correspond to the clusters of roads in these areas.

Other historic archaeological sites within the project include the remnants of trails, historic cabins, roads, bridges, lumber camps, ditches, homesteads, and Forest Service administrative buildings and compounds. In the 1930s, with the creation of the Civilian Conservation Corps, the pace of development and road building for recreation and Forest Service administrative uses increased. Old roads and trails were improved and new ones constructed in order to build lookouts, administrative buildings, and campgrounds; some of these roads were strung with phone lines for Forest Service administration. The archaeological remnants of the CCC era are on the fringes of the project APE.

Site integrity at many of the district's sites has been degraded by environmental forces such as fire, erosion, and flooding. Successive land uses can also compromise site integrity through abandonment, removal, modern mining, dispersed recreation, and administrative decisions. Employee and public safety have long been established administrative issues that have resulted in the closures of abandoned mines and the burning or demolition of condemned structures determined not eligible for the NRHP. Some original trails have also been converted to be more conducive for travel or to satisfy project needs related to accessibility. Since the 1930s, the Forest Service has been creating many of the main road arteries in current use today. These roads were built in support of the timber industry and exist today as part of the national forest road system. Prior to the NHPA Act of 1966, some of the roads used old trails. The Ship Mountain Road (16N02), the G-O Road (15N01) and countless other spurs were built on the design first laid out by pre-contact and historic trail systems.

Increasing amounts of recreational use on forestlands has also had a moderate effect on cultural resources. Recreational locations desired for their natural features are often the same locations that have been in use for countless generations. This can lead to looting, vandalism, and unanticipated impacts that can negatively affect a site's integrity. A number of routes considered for this project that lead to these types of dispersed recreation areas will need to have these types of effects mitigated and actively managed upon implementation.

Environmental Consequences

There are 27 cultural resources within the APE, which represents the maximum footprint of the project (Alternative 4). Twenty-three are historic archaeological sites, three are multi-component archaeological sites, and one is a gathering area, which contains an historic component. A route-by-route assessment was completed to determine the effects to cultural resources from the proposed alternatives (Confidential Tables in CRIR #R2014051011033 and CRIR #R2015051000047). These detailed assessments looked at the type of effect, nature of effects, severity of effect, and Standard Resource Protection Measures prescribed under Appendix E of the PA and Appendix B of the Motorized PA to determine no adverse effects.

The cultural resources that have been determined susceptible to effects based on the actions proposed in alternatives are called an *at-risk* historic property defined in the Motorized Recreation PA Part (I) (J) as: "…a property that the Forest Heritage Program Manager (HPM) identifies as susceptible to being adversely affected as a result of designating a motor vehicle OHV route or specifically defined area, or using or maintaining the designated motorized recreation OHV system. An *at-risk* historic property is identified based on property characteristics and proximity to designated OHV routes or specifically defined areas (e.g., trail corridor, trail head, vista point)." Table 3-45 displays the number of *at-risk* cultural resources for each alternative. Alternatives 5 contains the lowest number of *at-risk* cultural resources. The environmental consequences of each alternative are described below:

Table 3-45. Risk assessment of cultural resources associated with Alternatives 4 through 6.

Risk Factor	Alternative 1	Alternative 4	Alternative 5	Alternative 6
Not at risk	15	17	24	19
Total number of sites at risk	10	10	3	8
Total number of sites	25	27	27	27

Alternative 1 – No Action

Alternative 1 would cause unmitigated impacts to cultural resources and the loss of NRHP integrity values. This alternative has the highest number of historic properties at risk from ongoing use of UARs. At present, the potential for ongoing effects to ten cultural resources would continue if no management action were taken.

Direct and Indirect Effects: There would be no direct or indirect effects from the proposed actions, but there are three direct and seven indirect effects to cultural resources from current use patterns.

Cumulative Effects: Because there would be no mitigation measures in place for protecting the identified *at-risk* historic properties, the No Action alternative is the only alternative where the ten identified cultural resources would continue to be adversely effected.

Alternative 4

Direct and Indirect Effects: Confidential CRIR Report No. R2014051011033 displays the potential effects to ten cultural resources from this alternative. The effects are described below:

- Direct and indirect effects of designating facilities (presently UARs) to the NFTS, including identifying seasons of use and vehicle class; potentially eight cultural resources are indirectly or directly affected by designating roads and motorized trails to the NFTS.
- Direct and indirect effects of changes to the existing NFTS; potentially one cultural resource is directly affected from an un-inventoried UAR; one cultural resource will potentially have a direct beneficial effect from changes made to one route's maintenance level.
- Direct and indirect effects of decommissioning; there are no cultural resources affected.
- Direct and indirect effects of restoration: there are no cultural resources affected.

Cumulative Effects: Cumulative effects are not anticipated under this alternative because standard resource protection measures (SRPM), defined in Appendix B of the Motorized Recreation PA, will be applied. Additionally, mitigation measures prescribed during the course of past, present, and reasonably foreseeable projects occurring within the same spatial extent of the project area further reduce the potential for adverse cumulative effects.

Required Monitoring and Protection Measures: Monitoring of six cultural resources, a barrier for two cultural resources to block access to sites, and designated access for one tribal resource (Table 3-48). One cultural resource has negligible risk and does not require any protection measures.

Alternative 5

Direct and Indirect Effects: Confidential CRIR Report No. R2014051011033 displays the potential effects to three cultural resources from this alternative. The effects are described below:

- Direct and indirect effects of designating facilities (presently UARs) to the NFTS, including identifying seasons of use and vehicle class: potentially one cultural resource is indirectly affected by designating roads and motorized trails to the NFTS.
- Direct and indirect effects of changes to the existing NFTS: potentially one cultural resource is directly affected from the un-inventoried UAR; one cultural resource will potentially have a direct adverse effect from changes made to one route's maintenance level.
- Direct and indirect effects of decommissioning: there are no cultural resources affected.
- Direct and indirect effects of restoration: there are no cultural resources affected.

Cumulative Effects: Cumulative effects are not anticipated under this alternative because standard resource protection measures (SRPM), defined in Appendix B of the Motorized Recreation PA, will be applied. Additionally, mitigation measures prescribed during the course of past, present, and reasonably foreseeable projects occurring within the same spatial extent of the project area further reduce the potential for adverse cumulative effects.

Required Monitoring and Protection Measures: Barriers for two cultural resources to block access, and designated access for one tribal resource (Table 3-48).

Alternative 6

Direct and Indirect Effects: Confidential CRIR Report No. R2014051011033 displays the potential effects to eight cultural resources from this alternative. The effects are described below:

- Direct and indirect effects of designating facilities (presently UARs, trails, and/or areas) to the NFTS, including identifying seasons of use and vehicle class: potentially six cultural resources are directly or indirectly affected by designating roads and motorized trails to the NFTS.
- Direct and indirect effects of changes to the existing NFTS: potentially one cultural resource is directly affected from the un-inventoried UAR; one cultural resource will potentially have a direct beneficial effect from changes made to one route's maintenance level.
- Direct and indirect effects of decommissioning: there are no cultural resources affected.
- Direct and indirect effects of restoration: there are no cultural resources affected.

Cumulative Effects: Cumulative effects are not anticipated under this alternative because standard resource protection measures (SRPM), defined in Appendix B of the Motorized Recreation PA, will be applied. Additionally, mitigation measures prescribed during the course of past, present, and reasonably foreseeable projects occurring within the same spatial extent of the project area further reduce the potential for adverse cumulative effects.

Required Monitoring and Protection Measures: Monitoring of four cultural resources, a barrier for two cultural resources to block access to sites, and designated access for one tribal resource (Table 3-48). One cultural resource has negligible risk and does not require any protection measures.

Summary of Effects

Table 3-46 ranks the alternatives by the four indicators listed above to determine which alternative may have the greatest effect on cultural and tribal resources.

Using this analysis, a No Action alternative (Alternative 1) poses a significant risk to cultural resources because this alternative makes no attempt to discourage unauthorized travel. Under Alternative 1, the maximum number of cultural resources would continue to be affected through ongoing use. Furthermore, the lack of implementing cultural resource risk mitigations would result in the greatest level of impacts to forest cultural resources as integrity values continue to be diminished. However, because no additional routes will be designated under this alternative, use levels are not assumed to increase on undesignated roads thereby providing an inadvertent protective effect. Tribal access under a No Action alternative would neither be facilitated nor impeded.

According to the table, actions taken under Alternative 4 would also have a significant effect on cultural resources, but values associated with access to known or unknown tribal use areas would be retained or likely increased by allowing for the maximum footprint of newly designated routes.

Actions taken under Alternative 5 would have the least effect on cultural resources but may infringe upon access for other contemporary tribal uses. Actions taken under this alternative would generally reduce the frequency of ongoing unauthorized motor vehicle use thereby mitigating the degree to which NRHP values are currently being diminished. Furthermore, Alternative 5 proposes the least amount of newly designated routes, which provides additional protection to archaeological sites not currently considered legally accessible.

Alternative 6 is equally ranked with respect to Alternative 5, but interferes less with tribal access values by proposing to designate a number of new routes from presently UARs. Some of these newly designated routes will also access historic properties; therefore, it is not considered the alternative that is best for retaining cultural resource values associated with archaeological sites. However, through the implementation of SRPM, these values can still be protected and mitigated from continuing adverse impacts. While Alternatives 5 and 6 are similarly averaged, Alternative 6 maintains a high ranking across the indicator categories and is considered the best compromise between maintaining cultural values associated with NRHP compliance and contemporary use access by tribal members.

Table 3-46. Comparison of effects to cultural resources.

Indicators – Cultural Resources	Rankings of Alternatives for each Indicator[29]			
	Alt 1	Alt 4	Alt 5	Alt 6
Degree to which the integrity of historic property values are being diminished at current use levels.	1	2	5	4
Number of historic properties within UARs at risk from ongoing use.	1	2	5	4
Average number of historic properties per acre protected by excluding additionaly designated roads and motorized trails.	5	1	5	4
Level of access retained to known or unknown tribal use areas through route designation or closure.	3	5	1	4
Average for Cultural Resources	***2.5***	***2.5***	***4***	***4***

An alternate way to measure effects to cultural resources is to analyze the alternatives against three other indicators:

- Type of effect,
- Severity of effect, and
- Application of standard resource protection measures.

Table 3-47 summarizes the results of this alternate analysis, while Table 3-48 displays how each alternative may affect individual sites and includes the proposed standard resource protection measures that are required to result in a determination of *no adverse effect*.

When measured against the specific type of effects and severity, Alternative 1 poses the greatest threat to cultural resources because the maximum number of sites are at risk and no management actions would be taken to curb threats or current effects to NRHP integrity values. In contrast, Alternative 5 affects the smallest number of sites by reducing the number of routes through restoration and barricading activities, which minimizes the footprint of the APE and the risk associated with motorized vehicle access to many cultural resources.

Alternatives 4 and 6 affect a similar number of cultural resources in that they both consider access routes leading to dispersed recreation, which provide a larger APE than Alternatives 1 and 5. Alternatives 4 and 6 differ in the degree to which the effects to cultural resources need to be mitigated through the application of SRPM. By proposing the maximum number of designated motorized trails, Alternative 4 would impact the greatest number of cultural resources and requires more resource protection measures. Alternative 6 requires a fewer number of mitigation measures because some of those routes considered for designation to the NFTS in Alternative 4 would alternately be barricaded in this alternative.

[29] A score of 4 indicates the alternative is the best for cultural resources related to the indicator; A score of 1 indicates the alternative is the worst for cultural resources related to the indicator.

Table 3-47. Summary of effects from all alternatives.

			Alt 1	Alt 4	Alt 5	Alt 6
Sites in APE			25	27	27	27
Sites Not At Risk			15	17	24	18
Sites at Risk	Type of Effect	Direct	1	1	1	1
		Indirect	7	7	2	5
		Direct/Indirect	2	2	0	2
		Total	10	10	3	8
	Severity of Effect	Negligible	1	1	0	1
		Minor	7	7	1	5
		Moderate	2	2	2	2
		Severe	0	0	0	0
		Total	10	10	3	8
	SRPM[30]	Signage	0	0	0	0
		Monitor	0	6	0	4
		Barriers	0	2	2	2
		Designate Access	0	1	1	1
		Total[31]	0	9	3	7

Compliance with the Forest Plan and Other Direction

The Forest Plan outlines the conditions to be retained throughout the forest in order to ensure resource protection and enhancement. The Forest Plan standards and guidelines that govern management of cultural resources on the forest are listed in the form of four bullet statements in the *Analysis Framework* section above. In this section, four alternatives are analyzed in the context of the Forest Plan to determine whether and how they comply with Forest Plan standards and guidelines.

For Alternatives 4 through 6 the standards and guidelines in the Forest Plan for cultural resources would be met by addressing effects and identifying measures to determine *no adverse effects*. Alternative 1 is the only alternative that would deviate from Forest Plan direction and applicable cultural resource laws and implementing regulations because it does not identify measures to reduce effects to cultural resources from motorized travel.

Conclusion

Monitoring will be conducted at archaeological sites where minor effects are anticipated. Where moderate effects are anticipated, barriers (or other standard protection measures) will be in place. No sites are at risk for having severe effects. It is anticipated that there will be no adverse effects to historic properties under Alternatives 4, 5, or 6, if all standard protection measures are followed.

[30] SRPM refers to the Standard Resource Protection Measure defined in Appendix B of The Programmatic Agreement for Designating Motor Vehicle Routes and Managing Motorized Recreation on the National Forests in California.

[31] Alternative 1 does not constitute as an undertaking and therefore requires no SRPM. Negligible effects also do not require SRPM.

Table 3-48. Site effects and SRPM by alternative.

Count	FS Site #	Type of Effect	Severity of Effect	SRPM[32] Required by Alternative			
				Alt 1	Alt 4	Alt 5	Alt 6
1	05-10-51-2	None	N/A	No	No	No	No
2	05-10-51-10	Indirect	Minor	No	Monitor	No	Monitor
3	05-10-51-11	None	N/A	No	No	No	No
4	05-10-51-18	Indirect	Moderate	No	Barrier	Barrier	Barrier
5	05-10-51-26	Direct	Moderate	No	Barrier	Barrier	Barrier
6	05-10-51-27	Direct/Indirect	Minor	No	Monitor	No	Monitor
7	05-10-51-33	None	N/A	No	No	No	No
8	05-10-51-34	None	N/A	No	No	No	No
9	05-10-51-37	None	N/A	No	No	No	No
10	05-10-51-39	None	N/A	No	No	No	No
11	05-10-51-49	Direct/Indirect	Minor	No	Monitor	No	Monitor
12	05-10-51-55	Indirect	Minor	No	Monitor	No	Monitor
13	05-10-51-68	None	N/A	No	No	No	No
14	05-10-51-133	Indirect	Minor	No	Monitor	No	No
15	05-10-51-143	None	N/A	No	No	No	No
16	05-10-51-144	None	N/A	No	No	No	No
17	05-10-51-178	Indirect	Minor	No	Monitor	No	No
18	05-10-51-204	None	N/A	No	No	No	No
19	05-10-51-207	None	N/A	No	No	No	No
20	05-10-51-310	Indirect	Negligible	No	No	No	No
21	05-10-51-315	None	N/A	No	No	No	No
22	05-10-51-318	None	N/A	No	No	No	No
23	05-10-51-320	None	N/A	No	No	No	No
24	05-10-51-321	Indirect	Moderate	No	Allow Access	Allow Access	Allow Access
25	05-10-51-322	None	N/A	No	No	No	No
26	05-10-51-327	None	N/A	No	No	No	No
27	05-10-51-328	None	N/A	No	No	No	No

Inventoried Roadless Areas

Introduction

The USDA is responsible for managing NFS resources to sustain the health, diversity, and productivity of the nation's forests and grasslands to meet the needs of present and future generations (2001 Roadless Area Conservation Rule (66 FR 3272)). In the 1970s, the Forest Service studied all administratively designated primitive areas by inventoried and reviewed all roadless areas greater than 5,000 acres in the NFS. This study was known as the Roadless Area Review and Evaluation (RARE I). In 1972, RARE was terminated due to legal challenges. In 1977, the Forest Service began another nationwide Roadless Area

[32] SRPM refers to the Standard Resource Protection Measure defined in Appendix B of The Programmatic Agreement for Designating Motor Vehicle Routes and Managing Motorized Recreation on the National Forests in California.

Review and Evaluation (RARE II) to identify roadless and undeveloped areas suitable for inclusion in the National Wilderness Preservation System within the NFS. As a result of RARE II, 23 areas on the SRNF totaling approximately 313,000 acres are classified as roadless study areas, subject to evaluation for potential wilderness designation. Of these, approximately 121,000 acres were designated as wilderness by the California Wilderness Act of 1984. In 2006, the Northern California Coastal Wild Heritage Wilderness Act designated another 59,748 acres as wilderness mostly within IRAs.

Through the process of developing the Forest Plan, some IRAs or portions thereof were released, as the evaluation revealed these areas did not meet roadless criteria. Hence, they were not recommended as suitable for inclusion in the National Wilderness Preservation System. In 2011, the Roadless Rule was challenged in court and was upheld by the 10th District Court of Appeals as the management direction governing IRAs. Therefore, the proposed limited changes to the NFTS under the action alternatives within the prior released Packsaddle, North Fork Smith, Siskiyou B, Ship Mountain, Kelly, Monkey, and South Kalmiopsis IRAs, compared to the current condition represented by the No-action alternative, are analyzed against roadless area criteria.

Analysis Framework: Statute, Regulation, Forest Plan and Other Direction

The Multiple-Use Sustained-Yield Act of 1960 (MUSYA) provides the Forest Service the authority to manage national forest and grasslands “for outdoor recreation, range, timber, watershed, and wildlife and fish purposes.” Four years later, the historic Wilderness Act was passed establishing “a National Wilderness Preservation System to be composed of federally owned areas designated by Congress as *wilderness areas*, and administered for the use and enjoyment of the American people in such manner as will leave them unimpaired for future use and enjoyment as wilderness...” The Wilderness Act also provided for future wilderness additions by requiring the Secretary of Agriculture to review national forest lands for suitability for preservation as wilderness and further defined the Presidential and Congressional recommendation and adoption process for inclusion in the National Wilderness Preservation System (16 USC 1131-1136).

In 1967, as part of implementing the Wilderness Act, the Forest Service began the Roadless Area Review and Evaluation (RARE I), which identified lands that were at least 5,000 acres, had only foot trails, and were undeveloped. The inventory was completed in 1972, but was abandoned due to a successful legal challenge. In 1979, a second effort, known as RARE II, was completed through the NEPA process that sought to identify lands that may be included in a wilderness system. The RARE II evaluation allowed for more public input in the identification process that included lands with low levels of development, such as unimproved roads.

In 1984, the California Wilderness Act (PL 98-425) designated over 3 million acres of IRAs in California as part of the National Wilderness Preservation System, including the Siskiyou Wilderness on the Gasquet Ranger District. The Act also included a provision that RARE II lands in the State of California that were reviewed for inclusion, but not designated as wilderness or *planning areas*, should be managed for multiple use and need not be managed to protect their suitability for wilderness designation prior to or during revision of land management plans. These areas have since been referred to as *released* roadless areas. The Act goes on to state that areas recommended for wilderness designation shall be managed for the purposes of protecting their suitability for wilderness designation as required by the resource management plan (RPA) and the NFMA. In 2006, the Northern California Wild Heritage Act designated an additional 30,000 acres of IRA lands on the forest as part of the Siskiyou Wilderness.

The RPA, which was amended by the NFMA of 1976, reaffirmed multiple-use and sustained-yield as the guiding principles for land management planning of NFS lands (16 USC 1600, 1604), and required that forests be managed under land and resource management plans that provide for multiple use and sustained yield in coordination with wilderness, among other resource values. The Smith River NRA Act of 1990 includes multiple use direction for the following management areas: North Fork, Middle Fork/US Highway 199, Upper Middle Fork, Upper South Fork, Prescribed Timber, and Excluded. Forest Service regulations (36 CFR 294 Subpart B) prohibit road construction or reconstruction within IRAs, except in a limited number of circumstances.

Forest Service regulations (36 CFR 294 Subpart B) prohibit road construction or reconstruction within IRAs, except in a limited number of circumstances. The regulations do recognize that road maintenance is permissible in IRAs. The preamble to the regulations clarifies that the regulations do not prohibit the authorized construction, reconstruction, or maintenance of motorized trails (Federal Register, 2001). The regulations do recognize that road maintenance is permissible in IRAs. The preamble to the regulations clarifies that the regulations do not prohibit the authorized construction, reconstruction, or maintenance of motorized trails (Federal Register 2001). They describe the resources and features, often present within and that characterize IRAs, including: 1) high-quality or undisturbed soil, water, and air; 2) sources of public drinking water; 3) diversity of plant and animal communities; 4) habitat for threatened, endangered, proposed, candidate, and Sensitive species and for those species dependent on large, undisturbed areas of land; 5) primitive, semi-primitive non-motorized and semi-primitive motorized classes of dispersed recreation; 6) reference landscapes; 7) natural appearing landscapes with high scenic quality; 8) TCPs and sacred sites; and 9) other locally identified unique characteristics (Federal Register 2001), as described in Table 3-49.

Table 3-49. Inventoried roadless area (IRA) resources and features.

Characteristic	Description	Description of Potential Effect
Soil, water and air resources	These three key resources are the foundation upon which other resource values and outputs depend. Healthy watersheds provide clean water for domestic, agricultural, and industrial uses; help maintain abundant and healthy fish and wildlife populations; and are the basis for many forms of outdoor recreation.	***Soil and Water Resources.*** Motorized uses on native surface roads and UARs within the Smith River NRA have the potential to lower water quality, as they are sources of known sediment inputs to streams (Smith River Watershed Analysis, 1995). Roads are considered the principal cause of accelerated erosion in forests throughout the western United States (Reid and Dunne 1984, Furniss and others 1991, Grace and Clinton, 2007, Trombulak and Frissell 2000). Roads change soil density, temperature, soil water content, light levels, dust, surface waters, patterns of runoff, and sedimentation, as well as adding heavy metals (especially lead), salts, organic molecules, ozone, and nutrients to roadside environments (Trombulak and Frissell 2000). The use of roads, trails and other areas on national forest for public operation of motor vehicles also has potential to affect the soil resource through interception of runoff, compaction of soils, and detachment of sediment (Foltz 2006). The locations of roads determine the degree of potential impacts, making some roads more environmentally prone to resource damage compared to others. Use of motorized trails during the wet season can lead to trail widening, vegetation loss, soil compaction, and soil displacement, depending on the soil type and depth, vegetation condition, and effective groundcover. These impacts occur in areas where vehicles avoid obstacles such as rock outcrops and snow drifts driving where exposed soils lack effective groundcover in the form of rocks, vegetation, and downed woody debris. Under all action alternatives, proposed segments of unneeded UARs planned to barricaded and restored would promote revegetation of barren soils over time, reducing erosion and sediment delivery into streams downslope. ***Air.*** Air quality is good to excellent due to surrounding low population density, large undisturbed areas of intact forests and the remote nature of the IRAs. Use of motorized trails during the dry season can generate dust and low-level emissions; assumed to dissipate within a 100 feet of UARs.
Sources of public drinking water	NFS lands contain watersheds that are important sources of public drinking water. Careful management of these watersheds is crucial in maintaining the flow of clean water to a growing population.	There are no direct sources of public drinking water within the IRAs. No watershed-level effects with the potential to affect public drinking water are expected, as none are classified as municipal, and UARS are not present or the few routes that do exist occur on rocky soils; generally on plateaus.
Diversity of plant and animal communities	Undeveloped areas are more likely than roaded areas to support greater ecosystem health, including the diversity of native and desired nonnative plant and animal communities, due to the absence of disturbances caused by roads and accompanying activities. Inventoried roadless areas also conserve native biodiversity, by providing areas where nonnative invasive species are rare, uncommon, or absent.	Designation of specific motorized trails for vehicle use would confine habitat disturbance to the physical footprint and immediately alongside them. Closure and restoration of drainage patterns of unneeded UARs would reduce habitat disturbance within the IRA. Barricades would be constructed using native materials under all action alternatives to block access to sensitive plant occurrences and protect healthy POC. Additionally, where diversity of plant and animal communities are dependent on undisturbed areas, these communities would benefit from the action alternatives. There are no invasive weeds growing within or alongside proposed motorized trails to increase risk of spread.
Habitat for threatened, endangered and Sensitive species and species dependent on large undisturbed areas of land	Inventoried roadless areas function as biological strongholds and refuges for many species. Of the nation's species currently listed as threatened, endangered, or proposed for listing under the ESA, approximately 25% of animal species and 15% of plant species are likely to have habitat within IRAs on NFS lands.	All action alternatives propose barricading and restoring unneeded UARs not designated for use that would reduce habitat disturbance within the IRAs and benefit plant and animal communities dependent on undisturbed areas. As described more completely in the Wildlife section, fisher and marten occupy dense forest and shrub lands. The Siskiyou Wilderness lies adjacent to the IRA network within the project area to create linkages to large undisturbed areas.

Characteristic	Description	Description of Potential Effect
Primitive, semi-primitive non-motorized, and semi-primitive motorized classes of recreation	These areas often provide outstanding recreation opportunities such as hiking, camping, picnicking, wildlife viewing, hunting, fishing, cross-country skiing, and canoeing. While they may have many wilderness-like attributes unlike wilderness, the use of mountain bikes and motorized means of travel are allowed.	For those alternatives that propose converting select UARs to designated motorized trails allowing for vehicle use, maintenance and stormproofing, would provide for semi-primitive motorized classes of recreation and lower resource effects from continued travel. However, some forms of primitive and semi-primitive non-motorized recreation may be negatively impacted by the noise and presence of motor vehicles.
Reference landscapes for research study or interpretation	The body of knowledge about the effects of management activities over long periods of time and on large landscapes is very limited. Reference landscapes can provide comparison areas for evaluation and monitoring. These areas provide a natural setting that may be useful as a comparison to study the effects of more intensely managed areas.	Gradual revegetation of restored UARs would reduce the linear ground disturbance footprint on the landscape and increase the usefulness of the area as a reference landscape.
Landscape character and integrity	High quality scenery, especially scenery with natural-appearing landscapes, is a primary reason that people choose to recreate. In addition, quality scenery contributes directly to real estate values in neighboring communities and residential areas.	The action alternatives would all provide for maintaining or improving the scenic integrity and natural appearance of the IRA.
TCPs and sacred sites	TCPs are places, sites, structures, art, or objects that played an important role in the cultural history of a group. Sacred sites are places that have special religious significance to a group. TCPs and sacred sites may be eligible for protection under the National Historic Preservation Act.	No activities would occur within TCPS; therefore, places, sites, structures, art, or objects that played an important role in the cultural history of a group would not affected.
Other locally identified unique characteristics	Roadless area may offer other locally identified unique characteristics and values. Examples include uncommon geological formations, valued for their scientific and scenic qualities, or unique wetland complexes.	No activities would occur where geological formations, valued for their scientific and scenic qualities, or unique wetland complexes exist.

Affected Environment

Table 3-50 displays the eight IRAs totaling 80,360 acres and their acreage within the *Smith River National Recreation Area Restoration and Motorized Travel Management* project boundary, displayed in Figure 3-4.

Table 3-50. Inventoried roadless areas within the project boundary.

IRA Name	Acres in Project Boundary
Kelly	5,192
Monkey Creek	9,010
North Fork Smith	37,873
Packsaddle	3,858
Ship Mountain	11,929
Siskiyou A	424
Siskiyou B	11,755
South Kalmiopsis	321
Total Acres	***80,360***

These IRAs overlap with other land allocations that provide for botanical, wildlife and riparian needs such as Special Interest Areas, Late-Successional Reserves and Key Watershed as displayed on Figure 3-5.

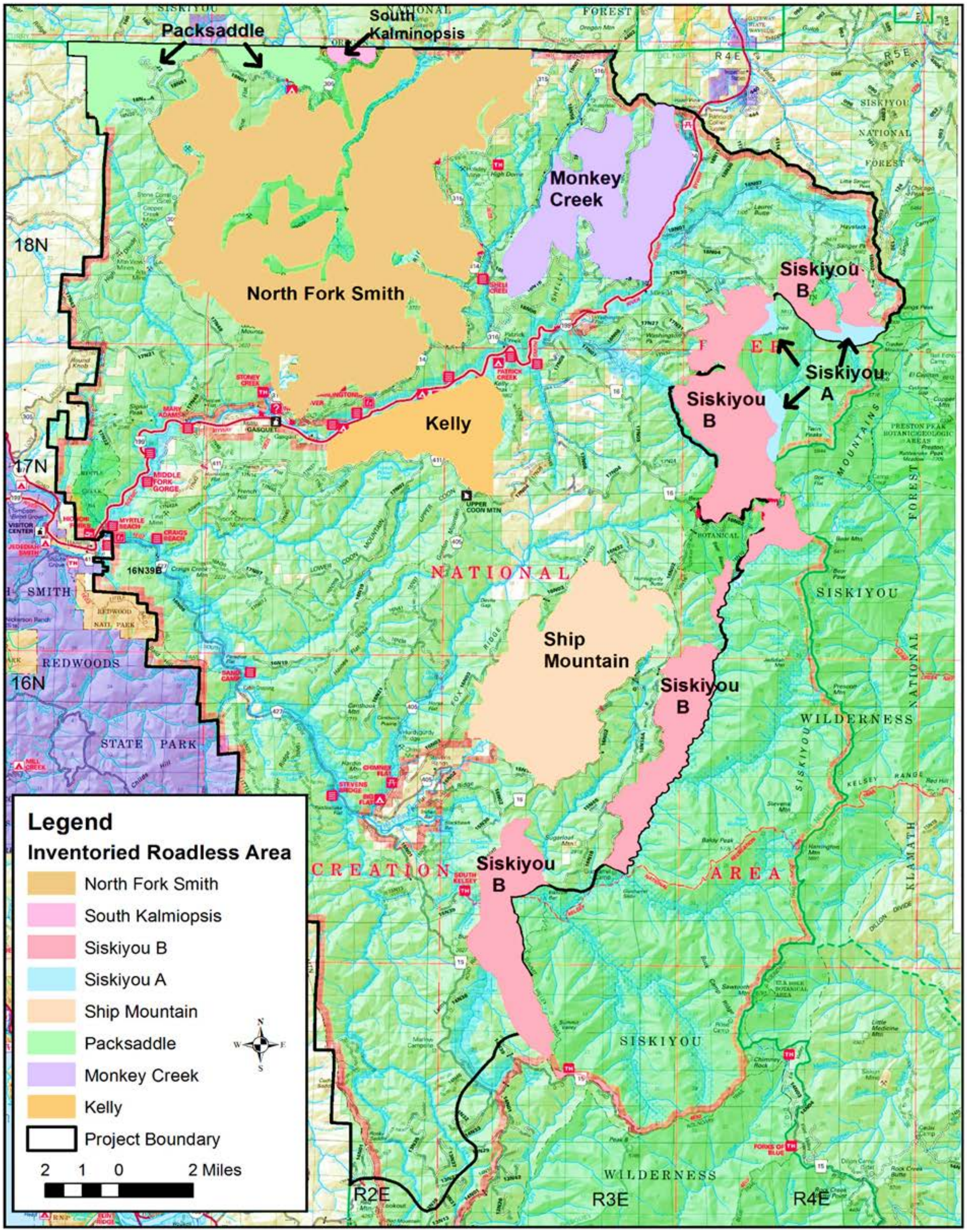

Figure 3-4. Map of inventoried roadless areas (IRAs) in the project area.

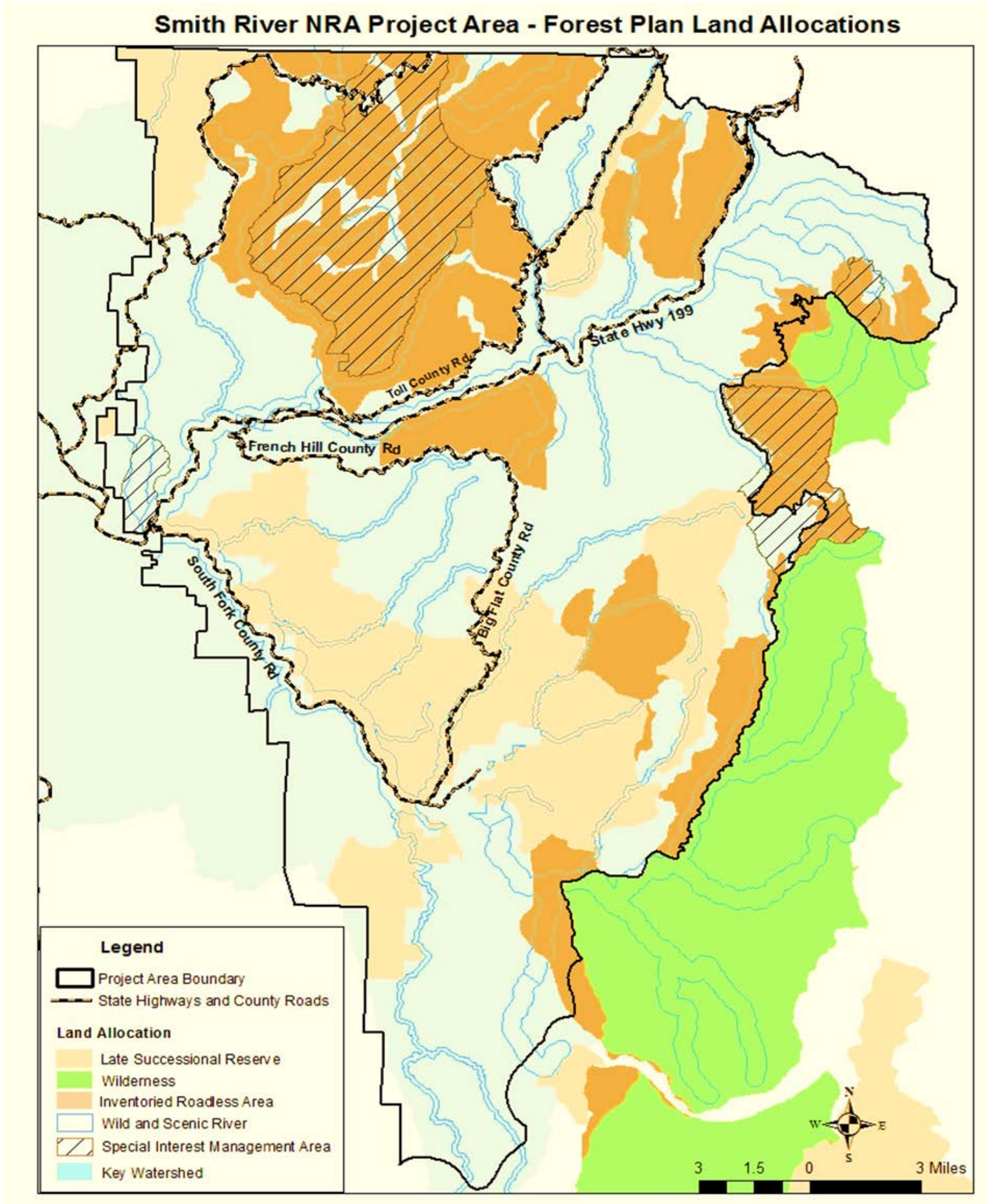

Figure 3-5. Map of inventoried roadless areas (IRAs) and overlapping land allocations in the project area.

Inventoried Roadless Areas (IRAs) within the Project Area

The following are excerpts from the Forest Plan FEIS Appendix C-1-11, and the Forest Plan FEIS Chapter III describing the unique characteristics of the eight IRA's within the project area:

Kelly

The entire Kelly IRA (5,192 acres) occurs within the project boundary, extending from east of French Hill Road to US Highway 199 and the Middle Fork of the Smith River on the north, to Kelly Peak on the east. Recreation opportunities are limited to fishing in the Middle Fork along US Highway 199. Existing recreation use is low. There are no trails in this area and cross-country travel is difficult and challenging because of the rocky nature of the surface and heavy brush. The area appears to have retained its natural integrity, affected primarily by the forces of nature, with high apparent naturalness. US Highway 199 can be seen and heard from the area; consequently, opportunities for solitude are low. Opportunities for primitive recreation are limited. Close to half of this IRA (46 percent) is within the Partial Retention Visual Quality Objective (VQO), while 29 percent is within Modification, and 25 percent is within Retention. There are currently 0.28 miles of UARs and 0.02 miles of ML 2 roads, and no motorized trails within the Kelly IRA.

Monkey Creek

Monkey Creek is the fourth largest IRA in the project area at 9,010 acres. The vegetation consists of dense stands of mature/old growth Douglas-fir, POC, and sugar pine. The slopes of Monkey Ridge contain large areas of knobcone pine, western white pine, Jeffrey pine, and incense cedar. Seventy-one percent of the IRA falls within the Modification VQO, 11 percent within Partial Retention, and 18 percent within Retention. The area contains occupied spotted owl habitat, habitat for the marbled murrelet, fisher and northern goshawk, and deer winter range. One Sensitive plant species is located in the area. The mineral development potential of this entire area is rated as low due to enactment of the Smith River NRA. Recreation opportunities are limited to road hunting and fishing in Monkey Creek, because of the lack of trails in the majority of the area and the steep, brushy terrain. Current use is low. There are currently 2.7 miles of UARs, and 2.7 miles of closed roads (ML 1), 7.1 miles of ML 2 (suitable for high-clearance vehicles) roads, and 1.0 mile of ML 3 (suitable for passenger cars) roads within the Monkey Creek IRA.

North Fork Smith

The North Fork Smith IRA is 38,789 acres in all. With 37,873 acres occurring on the Six Rivers, it is the largest IRA on the district. The additional 917 acres is on the Rogue River-Siskiyou National Forest, just 2 percent of the IRA. The western portion has been altered by roads and mining activities. Approximately 79 percent of this IRA occurs within the Modification VQO. This IRA is largely underlain by serpentine soils and characterized by sparse vegetation; however, it also encompasses the L.E. Horton RNA and the North Fork Botanical Area. See the *Botanical Resources* section of this chapter for more information on special interest areas, such as the North Fork Botanical Area and L.E. Horton RNA. Recreational opportunities are limited due to the steep, rocky gorges. Recreation consists of aquatic opportunities, rafting, kayaking and fishing. Recreation use is moderate. Opportunities for solitude are good. Several historic mine sites, abandoned mining roads, and UARs can be seen from certain vantage points. The opportunity for primitive recreation is best in the river canyons, which screen most human activity.

Packsaddle

The Packsaddle IRA straddles two national forests. On the Rogue River-Siskiyou National Forest, there are 5,552 acres, while there are 3,858 acres on the SRNF. Terrain is characterized by steep-sloped drainages. Vegetation varies from mixed conifer and Jeffrey pine to hardwoods and low brush. There are two species of Sensitive plants found here. The area contains spotted owl and peregrine falcon habitat. Recreation use is light.

Ship Mountain

Ship Mountain is the second largest IRA in the project area at 11,929 acres and occurs entirely within the project boundary. The area extends from Ship Mountain Road (FS 16N02) on the south and east and the Fox Ridge to Hurdygurdy Butte Road (FS 16N03) on the north and west. Current recreation use consists of hunting and small-stream fishing. Eighty percent of this IRA occurs within the Modification VQO, and 20 percent occurs within Partial Retention. There are no maintained trails and cross-country travel is difficult. Natural integrity is intact and the area remains natural appearing. Vegetation and topography restrict movement through the area, providing good opportunity for solitude and primitive recreation.

Siskiyou A

Portions of the Siskiyou A IRA were designated as the Siskiyou Wilderness per the Northern California Coastal Wilderness Act of 2006. There are approximately 424 acres of this IRA currently managed per the direction in the Roadless Rule. Of these acres, 58 percent and 42 percent occur within the Retention and Partial Retention VQOs respectively.

Siskiyou B

Portions of the Siskiyou B IRA were designated as the Siskiyou Wilderness per the Northern California Coastal Wilderness Act of 2006. There are 11,755 acres that were not designated as wilderness and are managed per the direction of the Roadless Rule, making this the third largest IRA in the project area. The IRA contains the Broken Rib Ecological Area and a small portion of the Bear Basin Butte Botanical Area. The northern parcel extends from Broken Rib Mountain to Wounded Knee Mountain. Another parcel includes the drainages of the South Siskiyou Fork and Siskiyou Fork of the Smith River. A final parcel consists primarily of the east slopes of the South Fork of the Smith, east slopes of Buck Mountain, Buck Creek, and Muslatt Mountain.

The area contains outstanding scenery allowing a view of a large part of the Siskiyou Crest. An approximately 230-acre tract has been noticeably altered by roads and timber harvests. The naturalness of the remaining areas has been modified very little. Portions of this IRA were affected by the Gasquet Complex of fires in late summer 2015. The Feeder and Bear Fires burned approximately 575 acres of the Siskiyou B IRA. Fifty percent of the fire footprint burned at very low intensity, while 39 percent burned at a low intensity, 9 percent at a moderate intensity, and 3 percent at a high intensity. A review of the Burn

Area Emergency Response report for botany, located in the project record and available upon request, found that there are no noxious weed threats associated with forest roads within the IRA.

Other minor impacts to scenery are from the presence of old trails. The opportunity for solitude and primitive recreation are high due to the area being adjacent to wilderness. In some locations, access roads are very close to the outer boundaries of these units, but use is very light on these roads. Recreation opportunities are diverse and tend to be concentrated in few areas.

South Kalmiopsis

The South Kalmiopsis IRA is mostly on the Rogue River-Siskiyou National Forest. Out of 75,232 acres comprising this IRA, only 321 acres occur on the Six Rivers. The Six Rivers portion is in the Fall Creek and Wimer Creek drainage. Recreation use is low to none. The area retains its natural integrity and generally appears natural. No activities are proposed in the SRNF portion of this IRA.

Other Roadless Areas

Within the project area, a few isolated areas of land do not currently have roads or inventoried UARs within them. When the roads are buffered, these unroaded patches are between 580 acres and 2,700 acres.

UARs, NFTS Roads and Motorized Trails

Portions of IRAs in the project area currently contain roads and motorized trails. Table 3-51 details the miles of inventoried UARs, existing NFTS roads and motorized trails that occur within IRAs in the project area.

Table 3-51. Miles of NFTS roads and UARs in inventoried roadless areas in the project area.

NFTS Roads by Maintenance Level[33] and Motorized Trails					UARs Total
1	2	3	Motorized Trails	Total	
10.0	12.0	3.6	6.3	31.9	20.5

Primitive and Semi-Primitive Recreation Opportunities

Recreation in IRAs and surrounding areas includes hunting, fishing, hiking, horseback riding, mountain biking, skiing, backpacking, camping, nature viewing, and motorized use.

Primitive and Semi-primitive Non-motorized Recreation Opportunities

There is no designated wilderness within the project area. The project area is directly adjacent to the Siskiyou Wilderness. Roads within the project area provide motorized access to trailheads accessing the Siskiyou Wilderness. The Siskiyou A and Siskiyou B IRAs extend beyond the project area, and are contiguous with lands previously designated as the Siskiyou Wilderness.

[33] Roads: ML 1 = closed to public use – custodial maintenance only; ML 2 = high clearance vehicles – both licensed and non-licensed; ML 3 = licensed vehicles only.

Opportunities for Semi-primitive Motorized Recreation

The Smith River NRA offers a unique landscape with a low density of roads within IRAs where recreationists may experience technical trail driving and access to remote dispersed recreation opportunities. The terrain and relative accessibility of the IRAs provide good opportunities for visitors to experience semi-primitive motorized conditions with a high degree of challenge and limited developed recreation facilities. The areas provide many opportunities to experience adventure, challenge, and self-reliance due to their mostly high elevation, ruggedness, and remoteness. Roads and motorized trails within these IRAs continue to be used by visitors and the local community. Motorized trails and ML 2 roads offer semi-primitive motorized recreation opportunities, of which there are currently 18.3 miles available.

Botanical Resources

Habitat for Threatened, Endangered, and Sensitive Plants

Ultramafic parent materials (i.e. bedrock), generically called serpentine, weather into soils that are high in heavy metals and low in essential nutrients. This serpentine soil chemistry along with other biological and physical factors, gave rise to distinctive plant communities that support a preponderance of rare plant species, many of which only occur on serpentine soils, resulting in their characterization as serpentine endemics (Strittholt and Dellasalla 2001). Within IRAs in the project area, 54,512 acres are estimated to be underlain by ultramafic bedrock, and are characterized here as suitable habitat for threatened, endangered, or Sensitive plant species occurring in the project area. For more information on habitat for threatened, endangered, or Sensitive species in the project area, see the *Affected Environment* section within *Botanical Resources* in this chapter. The project area contains *watch list species*, *Region 5 Sensitive species* (USDA 2013), and *threatened species* of plants. The watch list species is the Waldo buckwheat. The Sensitive species are the opposite-leaved lewisia, the serpentine catchfly, Howells jewelflower, the Mendocino gentian, and the western white bog violet. The threatened species is the McDonalds rockcress. Data from route-specific botanical surveys for rare species with a focus on UARs occurring within IRAs was tallied by species for motorized trails and UARs, and are presented in the following table. McDonalds rockcress does not occur on the inventoried UARs. Table 3-52 displays the number of rare plant occurrences by route within IRAs.

Table 3-52. Number of rare plant occurrences by route within IRAs.

Route Number	Number of Rare Plant Occurrences				
	Opposite-leaved lewisia	Serpentine catchfly	Howells jewelflower	Mendocino gentian	Western bog violet
17N49.100		1,139	52		
17N49.104		1,466	125		
17N49.105		864	6	600	50
17N49.105A		310	1		
17N49.106			4		
18N51.100	27				
305.107			14		
305.109	233	295			

Route Number	Number of Rare Plant Occurrences				
	Opposite-leaved lewisia	**Serpentine catchfly**	**Howells jewelflower**	**Mendocino gentian**	**Western bog violet**
305.109A	44		155		
305.115					
305.131			52		
Subtotal	***304***	***4,074***	***409***	***600***	***50***
Total	***6,106***				

Port-Orford-cedar

Port-Orford-cedar is the dominant riparian species in lands underlain by serpentine geology. Port-Orford-cedar provides shade for streams and stabilizes streambanks that provide habitat for aquatic species, including salmon (Strittholt and Dellasalla 2001). There are 3,625 acres of POC within IRAs in the project area. As of June 2013, approximately 7 percent or 245 acres is known to be infected with *Phytophthora lateralis*. More information on the affected environment related to POC and risks to it, is located in the *Port-Orford-Cedar* section within this chapter.

Effects Analysis Methodology

Assumptions

The following assumptions are central to the IRA effects analysis:

- Off-highway vehicle use is permitted in IRAs. Motorized trails can be designated to the NFTS provided roadless characteristics are maintained.
- The NFTS roads and UARs considered in the alternatives exist on the landscape, and therefore, provide the baseline of the current condition of the IRAs and do not represent a permanent development of the landscape. Motorized use is currently occurring within the IRAs.
- Consistent with Forest Service policy, a trail is a route established for travel by foot, stock, or trail vehicle, and can be over, or under 50-inches wide. Roads typically have been developed and used for the purpose of transportation (moving from point to destination); while trails often provide more opportunity for recreational motorized use (travel for the purpose of the motorized recreational experience). Motorized trails provide opportunities for semi-primitive motorized recreation in IRAs.
- Effects from all vehicle classes on roadless characteristics are assumed to be the same; therefore, changes in vehicle class will not be considered further in this analysis.
- Motorized road use levels of light (fewer than 25 motor vehicles per week) and low (25 to 100 motor vehicles per week) are considered compatible with the characteristics of IRAs. The current use level of all proposed UARs for all alternatives is light.
- Routes added to the NFTS as motorized trails would allow use for recreation and other outdoor visitor experiences.

- The proposed decommissioning and road closures, along with restoration of UARs would allow recovery of natural-appearing landscapes.
- Decommissioned, closed roads, and restored UARs would promote opportunities for primitive and semi-primitive non-motorized quiet recreational experiences providing for solitude from the sights, sounds, and presence of others.
- Use of motor vehicles in wilderness is prohibited. No alternatives include designating routes within wilderness or immediately adjacent (within a quarter mile) to wilderness boundaries; therefore, they are not directly affected or considered further in this analysis.
- The values used in this analysis are estimates derived primarily from GIS (geographic information system) and are expected to be relatively accurate taking into account topography, slope, and existing vegetation.
- For effects to POC, the analysis assumes UARs not designated to the NFTS are barricaded to minimize unintentional illegal use.
- For assumptions related to the indicator "Number of entries into uninfected POC stands or stream crossings with uninfected POC stands less than 300 meters downstream", see *Assumptions Specific to Port-Orford-Cedar* in the *Port-Orford-Cedar* section of this chapter.
- Contiguous patches of IRA lands smaller than 1,000 acres would not be of sufficient size to make its preservation and use in an unimpaired condition practicable.
- This analysis is an evaluation of effects to lands, which have already been deemed to possess roadless characteristics; it is not an evaluation for a recommendation on areas that should be qualified as *roadless*.
- Roadless areas, that are not included as areas identified in the *Forest Service Roadless Area Conservation Final Environmental Impact Statement, Volume 2 – Maps of Inventoried Roadless Areas* (November 2000), and that are at least 5,000 acres with only low levels of development are considered in this analysis.
- Underlying assumption is that those IRAs where management actions are restorative in nature (restoring UARs and decommissioning) would not need to be carried forward in the analysis as these actions are beneficial to IRA characteristics.

Data Sources

1995 Six Rivers National Forest Land and Resource Management Plan (Forest Plan). Table 3-53 describes the GIS layers used for the analysis.

Table 3-53. Spatial data used for the analysis and brief description.

Spatial Data	
Layer Name / Cross-Reference	**Description**
See *Data Sources* in the *Port-Orford-Cedar* section of this chapter.	Number of entries into uninfected POC stands or stream crossings with uninfected POC stands less than 300 meters downstream.
See *Data Sources* in the *Botanical Resources* section of this chapter.	Number of Sensitive plants within 30 feet of a designated motorized trail.
See *Data Sources* in the *Noxious Weeds* section of this chapter.	Noxious weeds indicator
Serp_UM.shp	Serpentine ultramafic shapefile
IRA_from_R5.shp	Inventoried roadless areas shapefile, Region 5 corporate data layer.
US_ST_CO_rds_10142011	State and county roads
Alternative_1_UAR_final_FEIS_6262015_ERRATA.shp Alt1_NFTS_final_FEIS_6262015_ERRATA.shp Alternative_4_final_FEIS_6262015_ERRATA.shp Alt4_NFTS_final_FEIS_6262015_ERRATA.shp Alternative_5_final_FEIS_6262015_ERRATA.shp Alt5_NFTS_final_FEIS_6262015_ERRATA.shp Alternative_6_final_FEIS_6262015_ERRATA.shp Alt6_NFTS_final_FEIS_6262015_ERRATA.shp	Alternative layers
Motorized_Trails_Existing_FEIS_1.shp	Existing motorized trails
Packsaddle_SRF_RRS.shp	The Packsaddle IRA that extends on to the Rogue River-Siskiyou National Forest.
Final_SoilBurnSeverity_GasquetComplex_CA_SRF_001488.shp	Gasquet Complex Burn Severity Footprint

Measurement Indicators

Indicators are used to measure effects to IRA characteristics (Table 3-54) and potential wilderness recommendations as part of the forest plan revision process (considered under a separate analysis), address the potential effects to botanical values, such as POC, Forest Service Sensitive plants, and endangered plants, primitive, semi-primitive non-motorized and solitude or a primitive unconfined type of recreation, as well as, opportunities for semi-primitive motorized classes of recreation. The IRA characteristics evaluated include soil and water resources; diversity of plant communities; reference landscapes; primitive, semi-primitive non-motorized and semi-primitive motorized classes of recreation; habitat for threatened, endangered and Sensitive plant species, and landscape character and integrity.

While IRAs are managed for multiple-uses in accordance with the Roadless Rule, they are evaluated and recommended through the forest plan revision process for inclusion in to the wilderness system. For this reason, effects to IRA characteristics considering wilderness evaluation criteria. Table 3-54 lists the indicators and the associated IRA characteristics and wilderness evaluation criteria.

Table 3-54. Indicators, associated IRA characteristics, and wilderness evaluation criteria.

Indicator(s)	IRA Characteristic(s) (Direct and Indirect Effects)	Wilderness Evaluation Criteria (Cumulative Effects)
Miles of ML 1 roads, decommissioned roads, and restored and barricaded UARs.	Soil and water resources	–
Number of times high-risk road or route directly accessed uninfected POC stands or indirectly accessed them by crossing a water source within 300 meters upstream of POC stands.	Diversity of plant communities Reference landscapes	–

Indicator(s)	IRA Characteristic(s) (Direct and Indirect Effects)	Wilderness Evaluation Criteria (Cumulative Effects)
Number of Sensitive plants within 30 feet of route, and Number of Sensitive plants within 30 to 100 feet of route.	Diversity of plant community	–
Acres of suitable habitat for threatened, endangered and Sensitive botanical species directly affected.	Habitat for threatened, endangered and Sensitive plant species Reference landscapes	–
Miles of ML 2-5 roads, motorized trails and UARs by visual quality objective (VQO).	Landscape character and integrity	–
Acres of IRA beyond a half mile of motorized trail or road open to motorized use.	Primitive, semi-primitive non-motorized class of recreation	–
Miles of motorized trails and ML 2 roads.	Semi-primitive motorized class of recreation	–
Miles of motorized trails, ML 2-5 roads, and UARs with weed sites	Diversity of plant communities	–
Contiguous Acres Patch Size	–	FSH 1909.12, 71.21: Areas to be included in the inventory must be federal lands and must meet one of the following size criteria (1) The area contains 5,000 acres or more.
Edge Density – feet per acre of edges of buffers on ML 2-5 roads and motorized trails.	–	FSH 1909.12, 72.1: (1) Evaluate the degree to which the area generally appears to be affected primarily by the forces of nature, with the imprints of man's work substantially unnoticeable (apparent naturalness). FSH 1909.12, 72.1: (3) Evaluate how an area less than 5,000 acres is of sufficient size to make its preservation and use in an unimpaired condition practicable.

Methodology for Direct and Indirect Effects by Indicator

The following section provides the methodology and rationale for each indicator that measures the direct and indirect effects to IRA characteristics and the cumulative effects to IRAs in respect to potential wilderness recommendations.

INDICATOR: Miles of ML 1, decommissioned roads, and UARs.

IRA Characteristic: Soil and Water Resources

This indicator is used to measure direct and indirect effects to soil and water resources**.** Roads can intercept rainfall directly on the surface and subsurface water moving down a hillslope; they concentrate flow, either on the surface or in an adjacent ditch; and they divert or reroute water from flow paths that it would take were the road not present (Gucinski et al. 2001). A road's drainage infrastructure (effectiveness of culverts, ditches, waterbars, etc.), surface condition (native (rocky) vs. gravel surfaced), location (ridgetop, mid-slope or streamside) determines the degree of potential impacts. The resulting soil erosion and downstream sedimentation can contribute to increasing water-quality risks (Furniss et al. 1997).

Actions that reduce motorized travel and restore hydrologic function, such as closing and decommissioning roads, and restoring and barricading UARs provide a long-term beneficial direct and indirect effect to soil and water resources for beneficial uses. Therefore, the miles of ML 1 roads, decommissioned roads, and restored and barricaded UARs are used as indicators to measure effects to IRA characteristics.

Short-term timeframe: <5 years.

Long-term timeframe: >10 to 30 years.

Spatial boundary: NFTS and inventoried UARs within IRAs in the project area.

Method: The alternative GIS spatial layers were clipped to the boundary of IRAs in the project area. The resulting NFTS and restoration activities were summed by alternative.

Results Table: Table 3-55 lists the miles of ML 1 and decommissioned roads, and restored and barricaded UARs within IRA boundaries by alternative.

Table 3-55. Risk to soil and water resources within IRA boundaries by alternative.

NFTS Status	Miles of closed and decommissioned roads, and barricaded and restored UARs by alternative			
	1	4	5	6
ML 1	10.15	1.59	0.34	1.59
Decommissioned	0	6.42	9.40	5.57
Restored and barricaded UARs	0	10.51	20.23	17.37
Total Miles	***10.15***	***18.52***	***29.97***	***24.53***

INDICATOR: Number of times a road or UAR accesses uninfected POC stands or indirectly accesses POC stands by crossing a water source with POC stands within 300 meters downstream of the crossing.

IRA Characteristic: Diversity of Plant Communities, Reference Landscapes

This indicator is used to measure direct and indirect effects to the diversity of plant communities and reference landscapes. Reference landscapes can provide comparison areas for evaluation and monitoring. These areas provide a natural setting that may be useful as a comparison to study the effects of more intensely managed areas.

Port-Orford-cedar’s natural range is limited to northwestern California and southwestern Oregon, but within that area, it grows over a broad environmental range and has some of the most diverse plant types within the region (Jimerson and Creasy 1991). There are approximately 3,300 acres (16 percent) of POC on the Smith River NRA infected with *Phytophthora lateralis*; however, within the footprint of IRAs on the Smith River NRA, only 245 acres (7 percent) of POC are infected. Although Jimerson, McGee and Jones (1999) mapped POC based on potential natural vegetation and 35 plant associations on federal lands in Region 5. Motor-vehicle traffic directly accessing a POC stand increases the risk of spreading the disease into that stand. Motor-vehicle traffic indirectly accessing POC stands by crossing streams with POC within 300 meters downstream of the crossing poses a high risk of introducing the disease into these stands.

Short-term timeframe: <5 years.

Long-term timeframe: >5 years.

Spatial boundary: Inventoried roadless areas within the project area.

Method: UARs and ML 2 through 5 roads within IRAs in the project area that either 1) enter into uninfected POC (the number of times a road or UAR entered into an uninfected POC stand); or 2) cross streams with uninfected POC stands growing less than 300 meters downstream (the distance to POC stands was calculated using GIS, as was the distance to the nearest uninfected POC stand downstream of the crossing, from the point where the road or route intersected the channel).

Results Table: Table 3-56 displays the number of times a road or UARs directly accesses uninfected POC stands or indirectly accesses uninfected POC stands by crossing a water source with POC stands within 300 meters downstream of the crossing.

Table 3-56. Number of POC events by alternative.

Action	Alt 1	Alt 4	Alt 5	Alt 6
Entries into uninfected POC stands or stream crossings with uninfected POC stands less than 300 meters downstream of ML 2 to 5 road, motorized trail, or UAR.	53	29	1	23

INDICATOR: Miles of proposed motorized trails, ML 2 through 5 roads, and UARs in IRAs with weed sites.

IRA Characteristic: Reference Landscape

Motorized travel on roads, motorized trails, and UARs is a vector for noxious weed dispersal and proliferation. Weeds are a threat to reference landscape features and ecological conditions that would normally be associated with an area without human intervention by directly competing with native plants and causing their local displacement. In addition, weeds can have a number of indirect effects. Potential impacts include alteration of disturbance regimes (including wildfire), loss of biodiversity, changes in the food base for wildlife species, soil erosion and loss of soil carbon storage, changes in soil moisture patterns, decreases in range or forest productivity, and altered recreational or aesthetic values. Weeds may also hybridize with native species, altering native plant genetics. When native plants are replaced by weeds, the entire ecosystem can be impacted, including microbial flora and fauna and insect pollinators, all of which contribute to normal ecosystem function and reference landscape conditions.

Short-term timeframe: 1 year.

Long-term timeframe: 20 years.

Spatial boundary: NFTS and inventoried UARs within IRAs in the project area.

Method: The alternative GIS spatial layers were clipped to the IRA boundaries. Actions by alternative were reviewed against the *weed sites affected by the proposed actions* table in the *Noxious Weeds* section of this chapter to identify which roads, motorized trails, and UARs had weed sites. The miles of ML 2 through 5 roads, motorized trails, and UARs with weeds sites within IRAs were totaled by alternative.

Results Table: Table 3-57 displays the miles of proposed motorized trails, ML 2 through 5 roads, and UARs in IRAs with weed sites.

Table 3-57. Miles of NFTS with weed sites within IRAs in the project area.

NFTS Status	Alt 1	Alt 4	Alt 5	Alt 6
ML 2	0.01	0.01	0	0.01
ML 3	2.46	2.46	2.46	2.46
ML 4-5	0	0	0	0
Motorized trails	0	0	0	0
UARs	0	0	0	0
Total	***2.47***	***2.47***	***2.46***	***2.47***

INDICATOR: Acres of habitat for threatened, endangered, or Sensitive botanical species within 30 feet of ML 2 through 5 roads, motorized trails, or UARs.

IRA Characteristics: Habitat for threatened, endangered, or Sensitive species, Reference Landscapes

Serpentine soil chemistry, along with other biological and physical factors, gave rise to distinctive plant communities that support a preponderance of rare plant species, many of which only occur on serpentine soils, resulting in their characterization as serpentine endemics.

Habitats that support the highest number and diversity of rare plants include seasonally dry serpentine settings and serpentine wetlands. Within these habitats, there are at least 27 plants considered rare by the California Native Plant Society, eight are on the Region 5 Sensitive plant list, and one is federally endangered.

Direct and indirect effects to Region 5 Sensitive plants and federally endangered plant habitat are assumed to occur within 30 feet of the center of inventoried UARs, roads and motorized trails. Field observation by forest biologists found that plants beyond 30 feet of travelways are not dusty due to road-generated dust; therefore, it is unlikely to result in direct effects to Sensitive plant habitat.

Short-term timeframe: 1 year.

Long-term timeframe: 20 years.

Spatial boundary: Lands within IRAs in the project area underlain by serpentine ultramafic parent material within 30 feet for direct effects of ML 2 through 5 roads and inventoried UARs proposed for designation to the NFTS as motorized trails, and restored UARs.

Method: UARs and ML 2 through 5 roads were clipped by alternative to the geographic extent of where serpentine ultramafic bedrock occurred within IRAs. Clipped routes were buffered by 30 feet on either side of the linear feature and merged. The buffered layer was then clipped to the geographic extent of the IRA boundaries, and then the GIS acres were calculated.

Results Table: Table 3-58 displays the acres of habitat for threatened, endangered, or Sensitive botanical species within 30 feet of ML 2 through 5 roads, motorized trails, and UARs.

Table 3-58. Acres of Sensitive plant habitat within 30 feet of the NFTS and UARs.

Indicator	Acres by Alternative			
	1	4	5	6
Sensitive plant habitat within 30 feet of the NFTS and UARs	138.3	95.8	16.2	40.3

INDICATOR: Number of Sensitive plants on or within 30 feet of motorized trails or UARs.

IRA Characteristic: Diversity of Plant Communities

Habitats that support the highest number and diversity of rare plants include seasonally dry serpentine settings and serpentine wetlands. Within these habitats, there are at least 27 plants considered rare by the California Native Plant Society, eight of which are on the Region 5 Sensitive plant list, and one is federally endangered.

Direct and indirect effects to Region 5 Sensitive and federally endangered plant species are assumed to occur within 30 feet of the center of inventoried UARs, roads and motorized trails. Indirect effects are associated with dust and are assumed to occur between 30 and 100 feet from the centerline of the travelway; however, it is unlikely that there would be any indirect dust-related effects associated with these routes due to low levels of use and high annual rainfall, the later preventing dust from accumulating from year to year; therefore, plants within 30 to 100 feet are not included in this analysis.

Short-term timeframe: 1 year.

Long-term timeframe: 20 years.

Spatial boundary: Inventoried roadless areas within the project area.

Method: The proposed NFTS and UARs by alternative were clipped to the IRA boundary. Proposed motorized trails and UARs with Sensitive plants occurring within 30 feet were identified. Data from route-specific botanical surveys for rare species with a focus on UARs was tallied by species.

Results Table: Table 3-59 lists the number of Sensitive plants on or within 30 feet of motorized trails and UARs.

Table 3-59. Number of Sensitive plants on or within 30 feet of motorized trails and UARs.

Indicator	Number of Sensitive Plants in IRAs by Alternative			
	1	4	5	6
Sensitive plants on or within 30 feet of motorized trails and UARs	6,106	3,887	0	2,689

INDICATOR: Miles of ML 2 through 5 roads, motorized trails and UARs, by VQO.

IRA Characteristics: Landscape character and integrity

Roads and motorized trails designated for motorized use, and UARs that may experience unintended illegal use, are linear features that may have a visual impact on the surrounding landscape. At their worst, they present uncharacteristic line qualities that affect the visual integrity of forest landscapes. Landscapes with a dense canopy cover have the capability of masking these linear alternations. Sparsely covered landscapes have less capability, and can adversely affect the forest's visual resources.

The VQO is captured in a GIS polygon layer that reflects the inventory of the forest's visual resources and was established as part of the forest plan to set the minimum acceptable threshold for landscape alternations. There are four VQOs in the project area—preservation, retention, partial retention, and modification—that provide for varying degrees of impact to the visual resource. The Preservation VQO only allows for ecological change; Retention provides for management activities that are not visually evident; Partial Retention allows activities to be evident, but must remain visually subordinate; and Modification allows management activities to be visually dominant. For more information on VQOs, see the *Visual Resources* section in this chapter.

Short-term timeframe: <15 years.

Long-term timeframe: >15 years.

Spatial boundary: Inventoried roadless areas in the project area.

Method: A GIS analysis was performed to clip the VQO layer to the IRA footprint within the project area. Acres of VQO by IRA were calculated. UARs, ML 2 through 5 roads, motorized trails, and restored routes that occur within IRAs were clipped to the VQO layer previously clipped to the extent of the IRAs within the project area.

Results Table: Table 3-60 displays the combined results of the miles of NFTS designated for motorized use or at risk for motorized use (not designated or barricaded) across all IRAs in the project area, and the acres of each VQO within IRAs in the project area.

Table 3-60. Miles of ML 2 through 5 roads, motorized trails, and UARs by VQO within IRAs.

Visual Quality Objective	Acres	Miles by Alternative			
		1	4	5	6
Modification	53,795	11.84	19.58	1.11	1.48
Partial Retention	15,701	1.53	1.803	2.23	2.5
Retention	10,828	2.2	3.35	0	0

INDICATOR: Miles of motorized trails and ML 2 roads in IRAs by alternative.

IRA Characteristic: Semi-primitive motorized classes of recreation

Semi-primitive motorized recreation opportunities include OHV touring. Maintenance Level 2 roads and motorized trails provide OHV touring opportunities on the forest. Under the Smith River NRA Act of 1990, motorized travel was limited to designated routes. Therefore, the miles of ML 2 roads and motorized trails are used as an indicator of the direct and indirect effects to the semi-primitive motorized classes of recreation.

Short-term timeframe: 3 years.

Long-term timeframe: >15 years.

Spatial boundary: Motorized trails and ML 2 roads on NFTS within IRAs within the project area.

Methodology: The proposed NFTS by alternative was clipped to the IRA boundary. The miles of ML 2 roads and motorized trails were tallied.

Results Table: Table 3-61 displays the miles of ML 2 roads and motorized trails occurring within IRAs in the project area.

Table 3-61. Miles of ML 2 roads and motorized trails occurring within and along the border of IRA boundaries.

Indicator	Miles by Alternative			
	1	4	5	6
ML 2 Roads	12.01	1.79	0.37	1.79
Motorized Trails	6.29	15.73	6.29	9.44
Total Miles	***18.3***	***16.42***	***6.66***	***12.23***

INDICATOR: Acres of land beyond a half mile of motorized trail or roads open to motorized use, ML 2 through 5 roads, county and state roads and UARs.

IRA Characteristic: Primitive and semi-primitive non-motorized classes of recreation

This indicator displays the impact the alternatives would have on non-motorized recreation, such as impacts related to dust, noise, and use conflicts.

Short-term timeframe: 1 year.

Long-term timeframe: 20 years.

Spatial boundary: Inventoried roadless areas within the project area.

Methodology: Roads open for motorized use, irrespective of the managing authority (e.g., Forest Service ML 2 through 5 roads, county roads, state and federal highways), and UARs, were buffered by a half mile from the centerline of the travelway. The buffer was used to clip the IRA footprint. The remaining IRA footprint acres were calculated and summed.

Results Table: Table 3-62 displays the acres of land beyond a half mile of motorized trail or roads open to motorized use, and UARs.

Table 3-62. Acres of land beyond a half mile of motorized trail or roads open to motorized use, unbarricaded UARs, and restored UARs.

Indicator	Acres in IRAs by Alternative			
	1	4	5	6
Acres beyond a half mile of ML 2-5 roads, motorized trails, unbarricaded UARs, county and state roads	32,342	40,938	47,827	42,383

Methodology for Cumulative Effects by Indicator

In the published study, *Importance of Roadless Areas in Biodiversity Conservation in Forested Ecosystems: Case Study of the Klamath-Siskiyou Ecoregion of the United States*, Strittholt and Dellasalla

(2001) state that fragmentation caused by roads on forest ecosystems has an overall cumulative effect on ecological integrity. Continuity, and conversely, landscape fragmentation, along with ecological integrity are two of the key components that IRAs and other lands included in the inventory are evaluated for in making recommendations for inclusion in the National Wilderness Preservation System. To that end, this analysis sought to analyze the effects of the project by alternative on the continuity or fragmentation of individual IRAs by evaluating contiguous patch sizes and assessing a measure of the apparent naturalness or unimpaired condition using edge density as a proxy. Changes from the No Action alternative (Alternative 1) are characterized as low, if between 1 and 33 percent; moderate, if greater than 33 percent and less than 66 percent; and high, if greater than 66 percent change.

Both indicators employed in the cumulative effects analysis use a 400-meter buffer. This buffer distance was selected due to its importance to POC, given that effects to POC will have a cascading effect on other resources, such as aquatic dependent species, water quality and soil stability. Jules et al. (2002) found that at a distance of 400 meters from a road or motorized trail, there was no distinguishable difference in infection rates to POC from the root disease.

Timeframe: 30 years. Project implementation is expected to be completed within 15 years. Allowing 5 years for the long-term direct and indirect effects to occur on some of the elements completed at the end of the implementation cycle, provides a temporal timeframe to consider cumulative effects as 30 years.

Spatial boundary: Inventoried roadless areas within the project area. The effects to IRAs that cross forest administrative boundaries were considered in context to how the proposed action would affect the IRA values under the management of the forest and across its entire geographic extent.

INDICATOR: Patches of contiguous acres over 5,000 acres, between 1,000 and 5,000 acres, and under 1,000 acres.

Wilderness Evaluation Criteria (FSH 1909.12, 71.21)**:** According to the Wilderness Act, a wilderness area "[h]as at least five thousand acres of land or is of sufficient size as to make practicable its preservation and use in an unimpaired condition" (16 USC 1131c).

This indicator provides a measure of the project's effects on IRA continuity and the coinciding effects on how these lands would or would not meet the wilderness size criteria per FSH 1909.12, 71.1(1). Inventoried roadless areas that contain 5,000 acres or more are included in the inventory of lands evaluated for their suitability as wilderness. Lands less than 5,000 acres are still eligible for inclusion, but must be of sufficient size to make practicable its preservation and use in an unimpaired condition (16 USC 1131c). Strittholt and Dellasalla (2001) defined size classes to evaluate the contribution of different sized patches. Consistent with the Wilderness Act's size criteria, the analysis includes patches over 5,000 acres (>2024ha), as well as patches between 1,000 and 5,000 acres (≥405ha to <2024ha), and smaller roadless areas (≥405ha to <2024ha).

In evaluating potential effects to an IRA character and values, contiguous patches represent IRA lands free from influence of county and state roads, ML 2 through 5 roads, and motorized trails to determine the extent in which improvements represent a departure from apparent naturalness (FSH 1909.12, 71.22). Per the Improvements Criteria (FSH 1909.12, 71.22a (2c(3))), ML 2 roads identified for continued public access and use in a project-level or travel-planning decision supported by NEPA analysis, are to be excluded from the inventory of areas under consideration for wilderness recommendation.

Method: County roads, state highways, ML 2 through 5 roads, and motorized trails in the project area were buffered by 400 meters on either side. Inventoried roadless areas within the buffer zone were removed from the IRA polygon for this analysis so that the remaining area represents IRA lands are likely to be in an unimpaired condition. The acres in the remaining polygons, otherwise referred to here as patches, were calculated by IRA, and are presented below in Table 3-63.

Results Table: Table 3-63 shows the number of patches and patch size in acres by IRA that are beyond 400 meters of county roads, state highways, ML 2 through 5 roads, and motorized trails within the district.

Table 3-63. Inventoried roadless area patches beyond 400 meters of roads and motorized trails.

IRA Name	Patch Number	Acres by Alternative			
		1	4	5	6
Kelly	1	3,977	3,972	3,972	3,972
Monkey Creek	1	14	14	14	14
	2	4,633	4,735	6,151	4,735
	3	148	148	0	148
North Fork Smith	1	469	345	469	345
	2	0	10	0	10
	3	902	876	902	876
	4	879	704	879	879
	5	28,868	26,840	28,799	27,848
	6	916	908	910	908
Packsaddle	1	979	979	979	979
	2	1,987	2,244	2,244	2,244
Ship Mountain	1	9,397	9,526	9,794	9,526
Siskiyou B	1	91	91	91	91
	2	58	58	58	58
	3	4,608	4,608	4,608	4,608
	4	3,193	3,193	3,193	3,193
	5	304	304	304	304
	6	994	994	994	994
	7	5,041	5,013	5,443	5,041
	8	132	136	136	136
	9	486	485	485	486
	10	1,078	1,078	1,078	1,078
Siskiyou A	1	425	425	425	425
	2	166	168	168	168
	3	424	424	424	424
South Kalmiopsis	1	150	150	150	150

INDICATOR: Edge density, or feet per acre of buffer edges on ML 2 through 5 roads, motorized trails, and UARs.

Wilderness Evaluation Criteria (FSH 1909.12, 72.1(1))**:** Evaluate the degree to which the area generally appears to be affected primarily by the forces of nature, with the imprints of man's work substantially unnoticeable (apparent naturalness). FSH 1909.12, 72.1(3): Evaluate how an area less than 5,000 acres is of sufficient size as to make practicable its preservation and use in an unimpaired condition.

This indicator is a metric for the quality of the *apparent naturalness* and *unimpaired condition* of the IRAs. This indicator provides a measure of the intensity of the change by providing a comparative basis to measure the effects of roads, motorized trails and UARS. The contiguous patch analysis discussed previously accounts for the edge effects of state and county roads, ML 2 through 5 roads, and motorized trails in estimating the size of IRAs free from influence of roads.

However, UARs in the project area were not included in the features that were buffered. The edge-density indicator includes the UARs to account for the risks associated with them on natural ecological processes. The lower the edge density, the higher the likelihood that the natural condition of the IRA is uncompromised by the effects of roads, motorized trails and UARs.

Method: For each alternative, state and county roads, ML 2 to 5 roads, motorized trails and UARs in the project area were buffered by 400 meters on either side. The length of the buffers was measured and divided by the acres per IRA to provide the edge density per IRA by alternative that is displayed in Table 3-64.

Results Table: Table 3-64 displays the edge density by alternative in feet per acre and by percent difference when compared against the No Action alternative. There was no change in edge density between the no action and the action alternatives for the South Kalmiopsis and Siskiyou A IRAs, so they are not listed in the table below.

Table 3-64. Change in edge density by IRA.

IRA Name	Metric	Alternative			
		1	4	5	6
Ship Mountain	Total feet per acre	14.92	12.35	9.87	12.18
	Percent change from no action	0	-17%	-34%	-18%
	Total change in feet per acre	0	-2.57	-5.05	-2.75
Kelly	Feet per acre	18.61	20.04	19.13	19.94
	Percent change from no action	0	8%	3%	7%
	Total change in feet per acre	0	1.42	0.51	1.32
Siskiyou B	Feet per acre	19.82	15.46	12.22	14.83
	Percent change from no action	0	-22%	-38%	-25%
	Total change in feet per acre	0	-4.36	-7.59	-4.99
Monkey Creek	Feet per acre	37.99	28.90	19.17	28.90
	Percent change from no action	0	-24%	-50%	-24%
	Total change in feet per acre	0	-9.09	-18.82	-9.09
North Fork Smith	Feet per acre	18.52	12.80	7.98	11.12
	Percent change from no action	0	-31%	-57%	-40%
	Total change in feet per acre	0	-5.72	-10.54	-7.41
Packsaddle	Feet per acre	24.23	13.14	8.76	10.81

IRA Name	Metric	Alternative			
		1	4	5	6
	Percent change from no action	0	-46%	-64%	-55%
	Total change in feet per acre	0	-11.09	-15.47	-13.41
Overall	***Feet per acre***	***139.47***	***108.08***	***82.51***	***103.15***
	Percent change from no action	***0***	***-23%***	***-41%***	***-26%***
	Total change in feet per acre	***0***	***-31.40***	***-56.96***	***-36.32***

Past Actions

Approximately 6,750 acres of IRAs on the district were designated as wilderness in the 1984 California Wilderness Act. Notable here is the 2015 Gasquet Complex, which included four fires, the Coon, Feeder, Bear, and Peak Fires. The Feeder and Bear fires were the only fires to burn within any IRAs within the project area. These fires burned approximately 575 acres of Siskiyou B IRA outside of the Siskiyou Wilderness. More information on the fires can be found under the Siskiyou B heading within the *Affected Environment* section of the IRA analysis.

Reasonably Foreseeable Future Actions

Projects considered here must overlap in time (30 years) and space (the spatial boundary of the cumulative effects analysis for IRAs), and must be reasonably foreseeable—in other words, in some phase of the planning process—to be considered. The cumulative effects project list, in Appendix C, includes summaries of the projects identified here. Projects considered in this analysis include:

- Northwest Forest Plan Revision, Wilderness Evaluation and Recommendation
- Forest-wide Roads Maintenance project
- Rogue River-Siskiyou National Forest Travel Management project
- Gordon Hill Vegetation Management project
    - One unit is on the boundary of the Kelly IRA, but not in the IRA, and includes 29 acres of timber stand improvement, as well as biomass with some commercial thin.
    - One road runs adjacent to the Kelly IRA for approximately 0.15 miles. A 150-foot fuel treatment extends into the IRA.
- Six Rivers Aquatic Restoration project
- Elk Ridge Fuelbreak.

Environmental Consequences

This section describes the direct, indirect and cumulative effects to IRAs as a land base by alternative. The analysis is organized by direct, indirect and cumulative effects to IRA characteristics. Table 3-65 identifies the proposed limited changes to the NFTS by alternative occurring within IRAs areas within the project area.

Table 3-65. Actions proposed by alternative within inventoried roadless areas in the project area.[34]

IRA Name	Acres in Project Boundary	Road/Route Type	Miles			
			Alt 1	Alt 4	Alt 5	Alt 6
Kelly	5,192	UAR	0.3 (unbarricaded)	0.3 (restored)	0.3 (restored)	0.3 (restored)
Monkey Creek	9,010	ML 1	2.7	0.34	0.34	0.34
		ML 2	7.1	1.4	0.37	1.5
		NFTS roads decommissioned	0	2.5	3.9	2.5
		UARs	2.7 miles (unbarricaded)	2.7 (restored)	2.7 (restored)	2.7 (restored)
North Fork Smith	37,873	ML 1	4.07			
		ML 2	0.2			
		Motorized Trail		9.4		3.13
		UAR	15.3 (unbarricaded)	5.6 (restored)	15.3 (restored)	12.17 (restored)
Packsaddle	3,858	ML 1	1.75			
		ML 2	0.6			
		NFTS roads decommissioned		3	3	3
		UAR	1.06 (unbarricaded)	1.06 (restored)	1.06 (restored)	1.06 (restored)
Ship Mountain	11,929	ML 1	1.08	1.25		1.25
		ML 2	3.11	0.22		0.22
		NFTS roads decommissioned		0.26	1.73	0.26
		Motorized Trail		0.03		0.03
		UAR	.34 (unbarricaded)	.34 (restored)	0.34 (restored)	0.34 (restored)
Siskiyou B	11,755	ML 1	0.53			
		ML 2	1.28	0.08		0.08
		NFTS roads decommissioned		0.53	0.61	0.53
		UAR	0.78 (unbarricaded)	0.78 (restored)	0.78 (restored)	0.78 (restored)

IRA Characteristics

Diversity of Plant Communities

Four indicators were used to assess the effects to the diversity of plant communities. Three of the indicators show a substantial difference among alternatives in their effects to the diversity of plant communities; however, the effects related to weed sites are the same in all alternatives, and therefore, are not shown in Table 3-66.

Alternative 1, the No Action alternative, poses the highest risk to diversity of plant communities as 53 road or UAR entries or crossings that would remain unbarricaded, whereby current trends affecting POC survival and spread of weeds would continue. The 6,106 sensitive plants growing within 30 feet of these UARs would continue to be at risk from unmanaged OHV use.

[34] UAR miles pertain to IRAs and are approximate due to fragments, estimate, and topographic errors with GIS any differences between draft and final documents are expected to be negligible and non-significant to these determinations.

All action alternatives (4, 5 and 6) provide resource protection to a higher degree than the No Action alternative. Common mitigations such as applying seasonal OHV use restrictions, road and motorized trail surfacing with gravel, and barricading and restoring drainage patterns on UARs would contribute to reducing or slowing the rate of resource damage. Management actions and monitoring would limit direct impacts to sensitive species 5 to 10 percent below the threshold of concern.

Alternative 4 reduces risk from the No Action alternative, but has a higher risk to the diversity of plant communities than alternatives 5 and 6. Alternative 5 provides the greatest reduction in risk with only one high-risk road or UAR entry or crossing, and no Sensitive plants within 30 feet of UARs or motorized trails. Alternative 6, the preferred alternative, reduces risk by over half when compared to the No Action alternative, with 23 high-risk road or UAR entries or crossings, and 2,689 Sensitive plants within 30 feet of UARs. Table 3-66 displays the results of the indicators used to measure effects to the diversity of plant communities.

Table 3-66. Indicators results on effects to the diversity of plant communities.

Indicator	Alternative			
	1	4	5	6
Number of times a UAR directly accessed uninfected POC stands or indirectly accessed them by crossing a water source with POC stands within 300 meters downstream of the crossing.	53	29	1	23
Miles of proposed motorized trails, ML 2 through 5 roads, and UARs in IRAs with weed sites.	2.47	2.47	2.46	2.47
Number of Sensitive plants on or within 30 feet of motorized trails and UARs.	6,106	3,887	0	2,689

Soil and Water Resources

Two indicators were used to assess the effects to soil and water resources. Alternative 1 poses the greatest risk to soil and water resources, as restoration of patterns on UAR that enter into riparian reserves or that cross through stream channels and other infrastructure improvements would not occur.

While Alternative 4 reduces risk from the No Action alternative, it poses a higher risk to soil and water resources than Alternatives 5 and 6. At the other end of the spectrum is Alternative 5, which provides the greatest reduction in risk with only one road or UAR entry or crossing, the most miles of closed and decommissioned roads, and 30.9 miles of restored and barricaded UARs. Alternative 6, the preferred alternative, reduces risk associated with POC by over half and more than triples the miles of restored and barricaded UARs, and closed and decommissioned roads when compared to the No Action alternative. Table 3-67 displays the results of the indicators used to measure effects to soil and water resources.

Table 3-67. Indicator results on effects to soil and water resources.

Indicator	Alternative			
	1	4	5	6
Number of times a UAR directly accessed uninfected POC stands or indirectly accessed them by crossing a water source with POC stands within 300 meters downstream of the crossing.	53	29	1	23
Miles of ML 1 and decommissioned roads and UARs.	0	22.74	35.78	30.9

Habitat for threatened, endangered, or Sensitive plants

Alternative 1 poses the greatest risk to habitat for threatened, endangered, or Sensitive plant species with approximately 138 acres of suitable habitat affected by the use of motorized trails, ML 2 and 3 roads, and unbarricaded UARs, which are at risk for being used by motorized vehicles. Alternative 5 poses the least amount of risk to habitat for threatened, endangered, or Sensitive plant species, with 16.2 acres of suitable habitat within 30 feet of motorized trails, and ML 2 and 3 roads. Alternative 6 greatly reduces risk to suitable habitat from the No Action alternative, with approximately 40 acres of suitable habitat potentially affected. While Alternative 4 reduces risk from the No Action alternative by 40 acres, when compared to the preferred alternative (Alternative 6), there are 55 more acres of suitable habitat within 30 feet of motorized trails, ML 2 and 3 roads, and UARs. Table 3-68 displays the indicator results used to measure effects to habitat for threatened, endangered, or Sensitive plants.

Table 3-68. Indicator results for effects to habitat for threatened, endangered, or Sensitive plants.

Indicator	Alternative			
	1	4	5	6
Acres of habitat for threatened, endangered, or Sensitive botanical species within 30 feet of ML 2 through 5 road, motorized trail, or UAR.	138.3	95.8	16.2	40.3

Reference Landscapes

Three indicators were used to assess the effects to reference landscapes. The effects related to weed sites are the same in all alternatives, and therefore, are not shown in the table below. Alternative 1 (No Action alternative) poses the highest risk to reference landscapes with 53 high-risk road or UAR entries or crossings, and 138 acres of suitable habitat within 30 feet of the designated NFTS or unbarricaded UARs. Alternative 5 provides the greatest reduction in risk with only one high-risk road or UAR entry or crossing, and 16 acres of suitable habitat within 30 feet of the designated NFTS or UARs. Alternative 6 (preferred alternative), when compared to the No Action alternative, reduces risk by over half for the POC indicator, and by more than a third for the suitable habitat indicator. While Alternative 4 reduces risk from the No Action alternative by 40 acres, when compared to the preferred alternative (Alternative 6), there are 55 more acres of suitable habitat within 30 feet of motorized trails, ML 2 and 3 roads, and UARs. Table 3-69 displays the results of the indicators used to measure effects to reference landscapes.

Table 3-69. Indicator results on effects to reference landscapes.

Indicator	Alternative			
	1	4	5	6
Number of times a road or UAR directly accessed uninfected POC stands or indirectly accessed them by crossing a water source with POC stands within 300 meters downstream of the crossing.	53	29	1	23
Acres of habitat for threatened, endangered, or Sensitive botanical species within 30 feet of ML 2 through 5 road, motorized trail, or UAR.	138.34	95.80	16.20	40.29

Landscape Character and Integrity

The Preservation VQO does not have any miles of roads, motorized trails, or UARs under any alternative, and therefore, is not affected by any of the alternatives. The No Action alternative includes 11.84 miles of linear features classified as Modification VQO. Alternative 4 has the greatest negative effect to visual resources, with the highest number of miles of linear features in all VQO categories when compared to the other alternatives. The Modification VQO is affected the most by Alternative 4, increasing the miles of linear features by 7.74 miles, when compared to the No Action alternative. Alternative 5 provides the greatest beneficial effect to visual resources, as it has the least number of miles of linear features in all VQO categories when compared to the other alternatives.

Alternative 6 reduces the negative effects to visual resources, when compared to the No Action alternative in all VQO categories. The Modification VQO benefits the most, with a reduction of 10.36 miles of linear features compared to the No Action alternative. Alternative 6's miles of linear features are only slightly higher than Alternative 5, which provides the greatest benefit to visual resources. Table 3-70 displays the results of the indicator analysis used to measure effects to landscape character and integrity.

Table 3-70. Change from Alternative 1 (no action) in miles of ML 2 through 5 roads, motorized trails, and unbarricaded UARs by VQO.

Visual Quality Objective	Acres	Miles	Miles by Alternative			
			1	4	5	6
Modification	53,795	Total	11.84	19.58	1.11	1.48
		Change from Alt 1 (no action)	0.00	7.74	-10.73	-10.36
Partial Retention	15,701	Total	1.53	1.803	1.103	1.473
		Change from Alt 1 (no action)	0.00	0.27	-0.43	-0.06
Retention	10,828	Total	2.2	2.85	1.73	2.05
		Change from Alt 1 (no action)	0.00	0.65	-0.47	-0.15
Preservation	34	Total	0.00	0.00	0.00	0.00
		Change from Alt 1 (no action)	0.00	0.00	0.00	0.00

Primitive, semi-primitive non-motorized class of recreation

Alternative 1 (No Action alternative) provides the least amount of primitive, semi-primitive non-motorized recreation with approximately 32,350 acres more than a half mile from motorized trails, roads open to motorized use, and unbarricaded UARs. Conversely, Alternative 5 provides the most opportunity for primitive, semi-primitive non-motorized recreation with 47,827 acres of land. Alternative 6, benefits this characteristic by providing just over 10,000 additional acres when compared to the No Action alternative. Alternative 4 provides slightly less benefit than the preferred alternative with approximately 8,600 additional acres when compared to Alternative 1. Table 3-71 displays the indicator results on effects to the primitive, semi-primitive non-motorized class of recreation.

Table 3-71. Indicator results for the effects to the primitive, semi-primitive non-motorized class of recreation.

Indicator	Acres by Alternative			
	1	4	5	6
Acres of land beyond a half mile of motorized trail or roads open to motorized use (ML 2 through 5 roads, county and state roads), unbarricaded UARs, and restored UAR.	32,342	40,938	47,827	42,383

Semi-primitive Motorized Class of Recreation

Alternative 5 provides the least amount of semi-primitive motorized recreation with approximately 15 miles of roads and motorized trails designated for motorized use. Alternative 4 provides the greatest amount of opportunities related to this characteristic, with approximately 26 miles of motorized recreation opportunity. Alternative 6 falls between Alternatives 4 and 5, by providing approximately 20 miles of motorized recreation opportunity. Alternative 1 (No Action alternative) provides less than the preferred alternative by approximately 2 miles. Table 3-72 displays the indicator results on effects to the semi-primitive motorized class of recreation.

Table 3-72. Indicator results on effects to the semi-primitive motorized class of recreation.

Indicator	Alternative			
	1	4	5	6
Miles of motorized trails and ML 2 roads in IRAs by alternative	18.3	26.3	15.1	20.0

Cumulative Effects

The following section describes how actions considered in the alternatives may affect the character and features of IRAs, by considering changes to contiguous patch size considering edge density, the apparent naturalness of the IRA, other unique characteristics, qualities, designations, and adjacent land management influencing the adjacent land ownership, in context of past, present and reasonably foreseeable future actions. Figure 3-6 provides a comparative display of contiguous patches within IRAs by alternative that are between 1,000 and 5,000 acres, while Figure 3-7 focuses on contiguous patches over 5,000 acres.

The *Forest-wide Aquatic Restoration* project, which is currently under analysis, would overlap in time and space with the direct and indirect effects of this project, but would not influence the cumulative effects analysis and determination as described below, because the actions proposed in the aquatic restoration project would not change landscape fragmentation patterns or edge density effects from roads. Likewise, the Forest-wide Roads Maintenance project, while overlapping in time and space with this project, would not influence the cumulative effects to IRAs as it would not change landscape-fragmentation patterns or edge-density effects from roads. The effects of the proposed *Rogue River-Siskiyou National Forest Travel Management* project occur on an IRA-specific basis and are described in IRA-specific summaries below.

Kelly

The 5,192-acre Kelly IRA does not have any roads or motorized trails that travel through its core. This IRA is bordered by US Highway 199 to the north. The dominant effects to this IRA’s character are influenced by the presence of the highway and its associated traffic and noise. To the south, this IRA is border by Forest Road 17N41. A limited portion of this IRA has roadside fuels treatments along 17N41 that are planned as part of the Gordon Hill Vegetation and Fuels Management project. However, the effects of this project are within the 400-meter buffer for roads and motorized trails used to estimate the contiguous patch size of the IRA beyond the influence of roads.

After buffering for the influence of roads, this IRA has one contiguous patch of 3,977 acres in the No Action alternative. All action alternatives maintain the continuity of the landscape; however, they would reduce the patch size by five acres. Figure 3-6 shows that in the context of the affected region, this is a low-magnitude degrading effect.

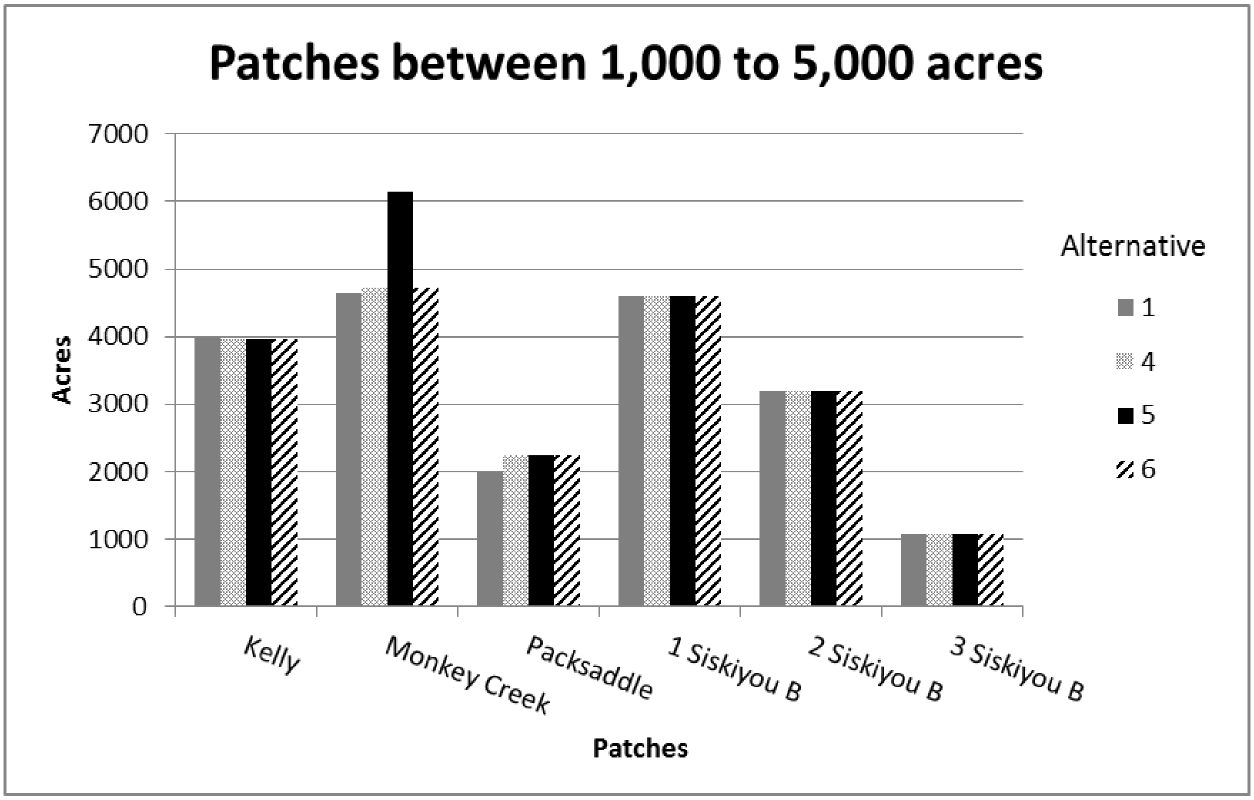

Figure 3-6. Inventoried roadless area (IRA) patches between 1,000 and 5,000 acres by alternative.

The edge-density indicator is used to evaluate the intensity of the action alternatives on the IRA. All action alternatives increase the edge density in this IRA; however, this increase is relatively small for all action alternatives. This increase of 8, 3 and 7 percent in Alternatives 4, 5 and 6, respectively, represents a low-intensity effect to the IRA.

Monkey Creek

Monkey Creek is the fourth largest IRA in the project area at 9,010 acres. The western edge of this IRA borders US Highway 199, and the eastern edge borders County Road 316. This IRA contains occupied spotted owl habitat, as well as habitat for the marbled murrelet, fisher and northern goshawk, and deer winter range. One Sensitive plant species is also located in the area. The mineral development potential of this entire area is rated as low as there are few existing claims and the enactment of the Smith River NRA withdrew the area from entertaining new mining claims. Recreation opportunities are limited to road hunting and fishing in Monkey Creek, due to a lack of trails in most of the area and steep, brushy terrain. This IRA is surrounded by NFS lands. No future foreseeable projects are planned for this area or adjacent lands that would affect the quality or continuity of the IRA.

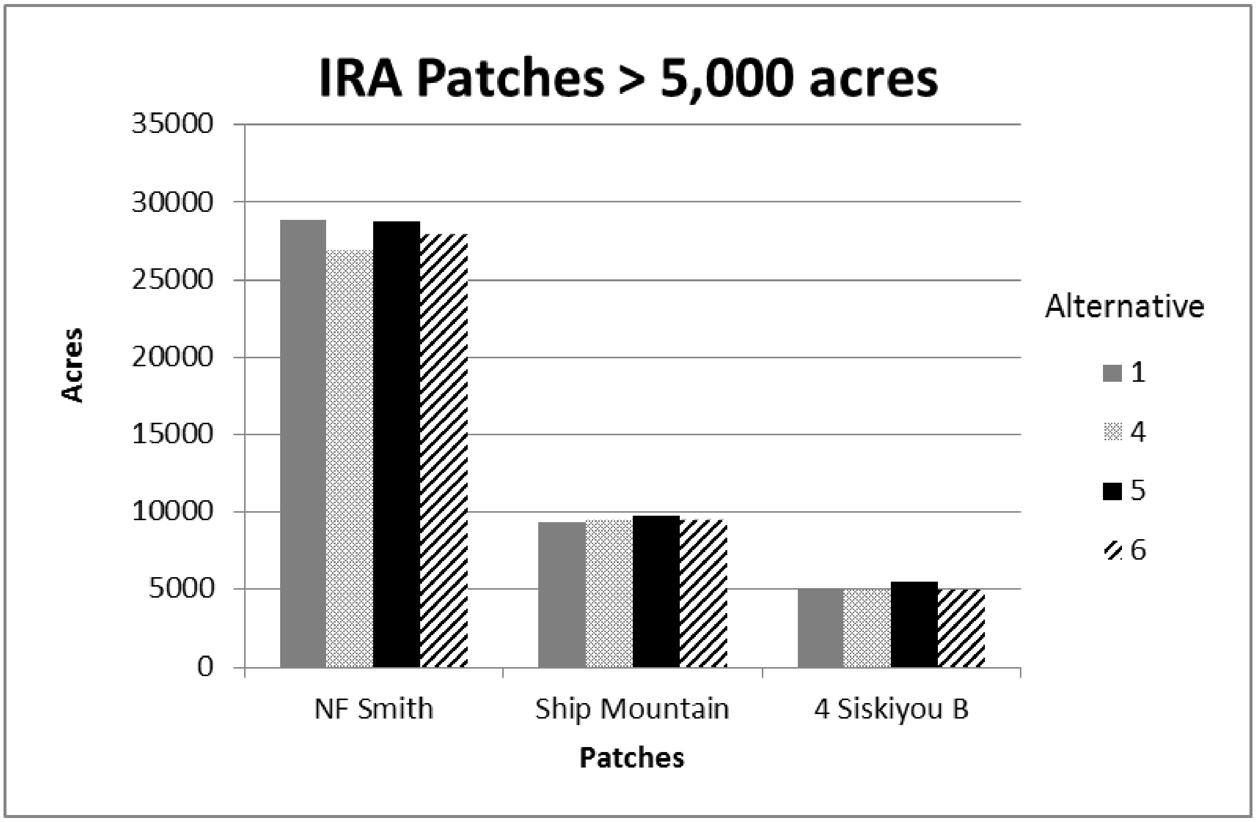

Figure 3-7. Inventoried roadless area (IRA) patches greater than 5,000 acres by alternative.

After buffering for the influence of roads and motorized trails, this IRA has three contiguous patches in the No Action alternative: 14, 148 and 4,633 acres. The analysis focuses on patches over 1,000 acres, as smaller patches are not large enough to make preservation and use in an unimpaired condition practicable.

All action alternatives maintain the continuity of the landscape and increase the size of the largest contiguous patch. Alternatives 4 and 6 increase the patch size by 2 percent to 4,735 acres, which represents a low-magnitude beneficial effect. Alternative 5 increases the continuity of acreage by 33 percent to 6,151 acres, which bumps this patch into the class size of lands over 5,000 acres. When an IRA is over 5,000 acres, it is automatically included in the inventory of lands evaluated for suitable for wilderness recommendation. This is characterized as a moderate-magnitude beneficial effect.

The edge-density indicator is used to evaluate the intensity of the action alternatives on the IRA's natural condition. The existing condition for Monkey Creek IRA is 32.13 feet per acre. All action alternatives decrease the edge density in this IRA. Alternatives 4 and 6 reduce the edge density by 24 percent, which constitutes a low-intensity beneficial effect to the IRA's natural condition. Alternative 5 reduces edge density by 50 percent, which constitutes a moderate-intensity beneficial effect to the natural character of the IRA.

Alternatives 4 and 6 both have a low-magnitude and low-intensity beneficial effect to the Monkey Creek IRA. Alternative 5 has a moderate-magnitude and moderate-intensity beneficial effect to the Monkey Creek IRA.

North Fork Smith

With 37,872 acres occurring on the Six Rivers, the North Fork Smith is the largest IRA on the district. The western portion of this IRA has been altered by roads and mining activities. Approximately 79 percent of this IRA occurs within the Modification VQO. This IRA is largely underlain by serpentine soils and characterized by sparse vegetation; however, it also encompasses the L.E. Horton RNA and the North Fork Botanical Area. Recreation opportunities are limited due to the steep, rocky gorges. Recreation use is moderate and consists of aquatic opportunities, rafting, kayaking and fishing. Opportunities for solitude are good. Several historic mine sites, abandoned mining roads, and UARs can be seen from certain vantage points. The opportunity for primitive recreation is best in the river canyons, which screens most human activity.

Routes that traverse the L.E. Horton RNA are proposed to be restored and barricaded. The RNA was established to protect an extensive serpentine wetland, referred to as a Darlingtonia bog, containing the Mendocino gentian and the western white bog violet, both Forest Service Sensitive plants.

Roads 18N13 and a portion of 18N09 that traverse Peridotite and Stony creeks are maintained as ML 1 roads and are closed to motor-vehicle use. The field visits to support the development of a supplemental information report on special interest area road closures found that the gate on 18N13 had been breached by motor vehicles. A more strategic location was identified in the report to prevent future breaches of the gate. The gate was relocated in 2014, under the authority of the original decision to maintain an effective road closure to mitigate risks to POC.

This IRA is largely surrounded by NFS lands. Much of the northern and western edge is bordered by County Road 305, and to south and east by County Road 315. The northern extent of the IRA in the project area extends onto the Rogue River-Siskiyou National Forest. There is one private inholding of approximately 235 acres in the southwest quadrant of the IRA, and additional private lands in the northwest corner. At this time, there are no new plans of operation for existing mining claims within this IRA. The Elk Camp Fuel Break, situated in the southwest tip of the IRA, has had multiple underburns and fuels treatments, and is projected for future treatments to keep fuel loading at level that lowers fire intensity and prevents crown fires. This project does not influence the cumulative effects determination, as the project does not fragment the landscape—the overstory is maintained and no new roads are built. Lastly, the passage of the Smith River NRA Act prevents the passage of new mining claims.

After buffering for the influence of roads and motorized trails, this IRA has five contiguous patches in the No Action alternative: 469, 879, 902, 916 and 28,868 acres. This analysis focuses on patches over 1,000 acres, as patches smaller than this are not large enough to make preservation and use in an unimpaired condition practicable.

All action alternatives maintain the continuity of the landscape; however, Alternatives 4, 5, and 6 decrease the patch size by 7 percent or 2,028 acres, 0.2 percent or 69 acres, and 3.5 percent or 1,020 acres, respectively. These decreases are characterized as low-magnitude degrading effects in context of the affected region.

The edge-density indicator is used to evaluate the intensity of the action alternatives on the IRA's natural condition. The existing condition for North Fork Smith IRA is 14.94 feet per acre. All action alternatives decrease the edge density in this IRA. Alternatives 4 and 6 reduce the edge density by 38 and 50 percent, respectively, which constitutes a moderate-intensity beneficial effect to the IRA's natural condition. Alternative 5 reduces edge density by 71 percent, which constitutes a high-intensity beneficial effect to the natural character of the North Fork Smith IRA.

All the action alternatives have a low-magnitude degrading effect to the continuity of the IRA, and do not reduce the contiguous patch below 5,000 acres. Decommissioning roads, and restoring and barricading UARs, under Alternatives 4 and 6, has a moderate-intensity beneficial effect, and under Alternative 5, a high-intensity beneficial effect to the natural character of the North Fork Smith IRA.

Packsaddle

The Packsaddle IRA is approximately 9,408 acres and straddles two national forests. Approximately 41 percent of the Packsaddle IRA lies within the administrative boundaries of the Six Rivers, while the remaining 49 percent occurs on the Rogue River-Siskiyou National Forest. The Rogue River-Siskiyou released their record of decision (ROD) on motor vehicle use earlier this year. The ROD does not propose to designate any new motorized trails or roads within the Rogue River-Siskiyou portion of the Packsaddle IRA. A portion of the IRA within the Rogue River-Siskiyou is proposed for mineral withdrawal. There are no other future foreseeable projects or activities planned within this IRA.

For the portions of the IRA on the Six Rivers, all action alternatives increase the continuity of the IRA when compared to the No Action alternative. There are two patches in the No Action alternative—979 and 1,987 acres. While the smaller patch remains the same size, the larger of the patches is increased by 13 percent across all action alternatives. This is considered a low-magnitude beneficial effect to the IRA's continuity, and when considered in context to the size of the entire IRA the magnitude decreases.

When considering the apparent naturalness of the land, the No Action alternative has the highest edge density at 17.52 feet per acre. Alternative 5 provides the greatest benefit to the apparent naturalness of the land by decreasing the edge density by 15.47 feet per acre or 88 percent, followed by Alternative 6, which reduces the edge density by 13.41 feet per acre or 77 percent, both of which are characterized as high-intensity beneficial effects. Alternative 4 reduces edge density by 11.09 feet per acre or 63 percent, which is characterized as a moderate-intensity beneficial effect.

Ship Mountain

The Ship Mountain IRA (11,928 acres) does not have any roads and motorized trails that travel through its core. The IRA contains a large portion of the headwaters of the Jones Creek watershed. On the southern border, the IRA abuts private land for about a half mile. The rest of the IRA boundary is NFS lands. There are no other future foreseeable actions planned that occur within or adjacent to this IRA. This IRA was characterized in the Forest Plan as having intact natural integrity and remaining natural in appearance. Vegetation and topography restrict movement through the area, providing good opportunities for solitude and primitive recreation.

After buffering for the influence of roads, this IRA has one contiguous patch of 9,397 acres in the No Action alternative. All action alternatives maintain the continuity of the landscape, and in fact, increase the size of the contiguous patch. Alternative 5 increases the continuity of acreage by 4 percent or 397 acres, while Alternatives 4 and 6 increase the acreage by 1 percent or 129 acres. Figure 3-7 illustrates the effects of the alternatives on patch size. When the increase in patch size is viewed in context with the affected region, the magnitude is low and beneficial.

When considering the apparent naturalness of the land, the No Action alternative has the highest edge density at 14.92 feet per acre. Alternative 5 provides the greatest benefit to the apparent naturalness of the land by decreasing the edge density by 5.05 feet per acre, a reduction of 34 percent; and therefore, is characterized as a moderate-intensity beneficial effects. Alternatives 4 and 6 decrease edge density by 17 and 18 percent, respectively, both low-intensity beneficial effects to the natural character of the IRA.

Under all action alternatives, this IRA is well over 5,000 acres. When considering the intensity of the project's effects on the IRA's natural condition, all action alternatives have a beneficial effect; however, Alternative 5 has a moderate beneficial effect, while Alternatives 4 and 6 have low beneficial effects. Given that the area maintains its continuity under all alternatives and that under the No Action alternative the IRA already has a relatively high measure of the natural intactness, it is likely that a moderate-intensity beneficial effect significantly improves the natural character of the IRA.

Siskiyou A

There are no effects from any of the alternatives on the continuity of the Siskiyou A IRA. There are no changes in the edge density by alternative, meaning that none of the alternatives affect the natural character of this IRA. There are approximately 424 acres of this IRA contiguous with lands that were previously designated as wilderness. The Siskiyou A IRA is bordered on the south by the Siskiyou Wilderness and to the north by the Siskiyou B IRA. There are no future foreseeable projects planned in this IRA. Since there are no effects to the size or the natural condition of this IRA, there are no cumulative effects to this IRA as a consequence of this project.

Siskiyou B

There are 11,755 acres of Siskiyou B IRA lands occurring within the project area. The Siskiyou B IRA is bordered on the north and west by NFS lands, and to the east by the Siskiyou Wilderness. The most norther portion is bordered to the south by the Siskiyou A IRA, and the Siskiyou Wilderness. There are no known future foreseeable actions planned for this IRA. The IRA contains the Broken Rib Ecological Area and a small portion of the Bear Basin Butte Botanical Area. The naturalness of the remaining areas has been modified very little. Minor impacts result from the presence of old trails. The opportunity for solitude and primitive recreation is high due to the area being adjacent to wilderness. In some locations, access roads are very close to the outer boundary of the IRA, but use is very light on these roads. Recreation opportunities are diverse and tend to be concentrated in few areas.

After buffering for the influence of roads, this IRA has three contiguous patches between 1,000 and 5,000 acres, and one contiguous patch over 5,000 acres. In addition, six patches are less than 1,000 acres. This analysis focuses on the patches over 1,000 acres, as smaller patches are not of sufficient size to make preservation and use in an unimpaired condition practicable. The continuity of the three patches between 1,000 and 5,000 acres are not affected by any of the alternatives, and remain the same size (4,608, 3,193 and 1,078 acres) regardless of the alternative. The largest contiguous patch in the No Action alternative

(5,041 acres) remains the same when compared to Alternative 6. Alternative 4 decreases the size by 28 acres, which is characterized as a low-magnitude degrading effect. Alternative 5 increases the size by 2 acres, which is characterized as a low-magnitude beneficial effect. The only effect of any of the alternatives on patch size was on the largest patch, which is characterized as low magnitude and does not precipitate a change in the class size under which it is considered in the inventory of lands evaluated for wilderness recommendation.

The edge density of the No Action alternative is 19.82 feet per acre. All action alternatives reduce the edge density in the Siskiyou B IRA; however, the intensity of the reduction varies by alternative. At the greatest intensity is Alternative 5, which reduces the edge density by 38 percent, which is characterized as a moderate-intensity beneficial effect to the natural character of the IRA. Alternatives 4 and 6 reduce edge density by 25 and 22 percent, respectively—both low-intensity beneficial effects to the natural character of the IRA.

Given that the existing condition of this IRA is in a relatively intact natural condition, and that adjacent lands include designated wilderness to the west and other IRA lands to the north, much of this area's consideration for potential wilderness designation relies on the natural condition of the IRA. This is especially true for the three IRA patches between 1,000 and 5,000 acres. While all the action alternatives provide a beneficial effect, Alternative 5 is most likely to improve natural conditions.

South Kalmiopsis

Only 0.4 percent of the South Kalmiopsis IRA occurs within the project area. The remaining lands in this IRA are managed by the Rogue River-Siskiyou NF. There are no future foreseeable actions planned within this IRA in the project area. There is one contiguous patch of 150 acres across all alternatives. There is no change in the edge density across any of the alternatives, including the No Action alternative. The alternatives have no effect on the continuity or the natural condition of this patch. The alternatives considered in detail have no effect on the size or condition of the IRA; and therefore, do not result in cumulative effects to the IRA.

Summary of Effects

Direct and indirect effects of the alternatives on roadless characteristics are summarized in Table 3-73, while the cumulative effects to individual IRAs are summarized in Table 3-74. Table 3-75 provides an overall ranking of the alternatives when considering direct/indirect and cumulative effects. The effects to the characteristics are ranked 1 through 4. A ranking of 1 indicates the most adverse effect, while a ranking of 4 indicates the most beneficial effect. As shown, the alternatives result in varying degrees of effects to roadless characteristics.

Table 3-73. Summary of direct and indirect effects of alternatives to IRA characteristics.

IRA Characteristics	Alt 1	Alt 4	Alt 5	Alt 6
Diversity of Plant Communities	1	2	4	3
Soil and Water Resources	1	2	4	3
Habitat for threatened, endangered, or Sensitive Plants	1	2	4	3
Reference landscapes	1	2	4	3
Landscape character and integrity	2	1	4	3
Primitive, semi-primitive non-motorized class of recreation	1	2	4	3
Semi-primitive motorized class of recreation	2	4	1	3
Average	***1.3***	***2.1***	***3.6***	***3.0***

Table 3-74. Summary of cumulative effects to IRAs by alternative in wilderness recommendations.

Inventoried Roadless Area	Alt 1	Alt 4	Alt 5	Alt 6
Kelly	2	1	1	1
Monkey Creek	2	3	4	3
North Fork Smith	2	3	4	3
Packsaddle	1	3	3	3
Ship Mountain	2	3	4	3
Siskiyou A	2	2	2	2
Siskiyou B	2	3	4	3
South Kalmiopsis	2	2	2	2
Average	***1.9***	***2.7***	***3.3***	***2.7***

Table 3-75. Average ranking of direct, indirect, and cumulative effects.

Type of Effect	Alt 1	Alt 4	Alt 5	Alt 6
Direct and Indirect	1.3	2.1	3.6	3.0
Cumulative	1.9	2.7	3.3	2.7
Average	***1.6***	***2.4***	***3.5***	***2.9***

Compliance with the Forest Plan and Other Direction

The analysis and results demonstrate that the alternatives analyzed in detail are consistent with the Roadless Rule of 2001. The proposed activities within the alternatives are consistent with multiple-use management in that motorized use is considered in two of the project alternatives. The project is consistent with the Roadless Rule prohibitions on timber harvest and road construction, as it does not propose to harvest timber or construct roads. Two of the alternatives propose to designate motorized trails within IRAs, which is consistent, as the Roadless Rule did not intend to prohibit the authorized construction, reconstruction, or maintenance of motorized trails (66 FR 3251). The results of this analysis demonstrate that the features that often characterize IRAs benefit overall from the implementation of any of the action alternatives when compared to the No Action alternative. Lastly, the analysis of the effects to potential wilderness recommendation complies with Roadless Rule direction.

As presented in the *Analysis Framework* section of this analysis, the appropriate place to consider additional IRA protections is during the land management planning process, pursuant to the new planning regulations at 36 CFR part 219, Subpart A. While this project does not propose any Forest Plan amendments in respect to IRAs, the methods used to analyze cumulative effects to IRAs considered potential wilderness suitability evaluation criteria identified in FSH 1909.12, Chapter 70, §71.3-72.1, per the direction of the 2012 Planning Rule.

When considering consistency with the Forest Plan, some management area direction does not apply given that it provides guidance on activities that are not proposed in the project, such as timber harvest, acquisition of lands, fire suppression, wildfire reforestation, and minerals and mining regulations. Likewise, the management area direction for wild, scenic and recreational rivers is irrelevant here, as the direction pertains to the removal of trees within streamside protection zones, an activity not proposed in this project. Other resource-specific broad management area direction is addressed in the associated resource section in this chapter.

The proposed project activities are found to be consistent with specific management area direction occurring within IRAs. Table 3-76 outlines the management area, management area direction, IRAs within that management area, and provides a consistency analysis and determination.

Table 3-76. Consistency with management area direction.

Management Area Name	Management Area Direction	IRAs	Consistency Analysis and Determination
North Fork	Provide and maintain facilities for recreation activities. Provide for river access.	North Fork Smith Packsaddle South Kalmiopsis	Providing for recreational opportunities is part of the purpose and need of the project. A range of alternatives are analyzed in detail with varying levels of motorized recreation facilities. The alternatives do not propose to eliminate any existing river access. The project alternatives are consistent with the management area direction in IRAs within the North Fork Management Area.
Middle Fork / US Highway 199	Provide for visitor services. Incorporate national scenic byway managment direction when completed. Manage for wildlife and scenic values.	North Fork Smith Kelly Monkey Creek	The outcome of the project would be an updated MVUM and an NFTS that is more clearly defined through signage and barricading, which would improve the level of visitor services from its current status. When considering consistency with scenic values, the cumulative effects analysis indicator edge density can be used as a proxy. Edge density is derived from miles of roads and motorized trails per acre, and linear features are the primary impact to scenic integrity under consideration in this project. The Kelly IRA was the only IRA of the three in consideration here that had increased edge density and this was characterized as a low-intensity effect. Given this project does not entertain any other activities that would dramatically alter the scenic values of this management area, this project is found to be consistent with the management direction for the Middle Fork/US Highway 199 within IRAs.
Upper Middle Fork	Manage to maintain and enhance diverse values: ecological communities, aesthetics, wildlife/fish.	Siskiyou A Siskiyou B	The cumulative effects analysis shows that this project does not have any effects to the Siskiyou A IRA. When considering maintenance of ecological diversity, the cumulative effects analysis indicator edge density can be used as a proxy. Edge density is derived from miles of roads and motorized trails per acre, and roads are known to have impacts to ecological values. The edge density was reduced for by all project alternatives in the Siskiyou B IRA, therefore it is determined that the alternatives analyzed in detail are consistent with the Upper Middle Fork Management Area direction as it applies to IRAs within it.

Management Area Name	Management Area Direction	IRAs	Consistency Analysis and Determination
Upper South Fork	Provide facilities consistent with the wild character of the management area for hiking, fishing and hunting.	Siskiyou B	The range of alternatives include semi-primitive recreation opportunity provided by the continued provision of ML 2 roads that provide access to trailheads leading into the IRA or adjacent wilderness area. The miles of semi-primitive motorized recreation opportunity vary by alternative, but all provide for some level of backcountry recreation opportunities in this remote IRA. It is determined that the alternatives analyzed in detail are consistent with the Upper South Fork Management Area direction as it applies to IRAs within it.
Prescribed Timber	NA	Kelly Ship Mountain Packsaddle Monkey Creek Siskiyou B	This management area direction pertains to timber harvest. This project does not propose to harvest timber; therefore, this management area direction does not apply to the project activities.

Noxious Weeds

Introduction

The Chief of the Forest Service has determined that invasive species are one of four significant threats to forests and rangelands. The presence of these invaders affects many other resources, such as soil, wildlife habitat, and Sensitive plants, so it is important to analyze and understand the effects of the project on noxious weed populations. Concerning motorized recreation several studies (Rooney 2003, Lippe and Kowarik 2006) have found that motorized vehicles did pick up and disperse non-native invasive plant species (noxious weeds) and that the probability of colonization increased with increasing traffic.

Analysis Framework: Statute, Regulation, Forest Plan, and Other Direction

Statute, regulation, Forest Plan, and direction pertinent to the management and prevention of noxious weeds under the proposed action include:

Direction for the development of noxious weed prevention and management practices is provided in National Policy FSM 2080 Noxious Weed Management, Executive Order on Invasive Species (1999), and *Stemming the Invasive Tide, Forest Service Strategy for Noxious and Nonnative Invasive Plant Management* (USDA 1998).

The Executive Order on Invasive Species, signed by the President on February 3, 1999, called on federal agencies to use relevant programs and authorities to prevent the introduction of invasive species, and not authorize or carry out actions that are likely to cause the introduction or spread of invasive species unless the agency has determined and made public documentation that shows that the benefits of such actions clearly outweigh the potential harm and all feasible and prudent measures to minimize risk of harm will be taken in conjunction with the actions.

In 1995, the Forest Service revised its national policy on noxious weed management (FSM 2080) and set, as a high priority for the agency, preventing the introduction and establishment of noxious weed infestations. It also directs the Forest Service to determine the factors, which favor the establishment and spread of noxious weeds and design management practices to reduce the risk of spread.

In 1998, the Forest Service developed in conjunction with other federal agencies a strategy for the management of noxious weeds. *Pulling Together: A National Strategy for Invasive Plant Management* focused on three primary goals, effective prevention; control; and restoration. The Forest Service also developed a national strategy focusing on five areas, prevention and education; control; inventory, mapping, and monitoring; research; administration and planning.

In response to this national strategy, the Pacific Southwest Region developed a Noxious Weed Management Strategy and Action Plan. This action plan noted that during the development of forest plans in the 1980s and early 1990s, the problems caused by noxious weeds were not widely recognized, hence these plans lack the specificity found within the Region 5 Action Plan. The following are examples:

- Weed prevention practices and mitigation measures will be incorporated into all Forest Service activities.
- Noxious weed prevention clauses will be incorporated into Forest Service contracts, and permits.
- Prepare a noxious weed risk assessment for all ground-disturbing projects.
- Noxious weed risk assessments will become an integral part of project planning.

In 2001, SRNF approved a standardized method for assessing the risk of introducing or spreading noxious weeds related to proposed actions. The major goal of the noxious weed risk assessment is to serve as a first step in a strategy aimed at reducing management-related introduction and spread of noxious weeds on the forest. Risk assessment is essential for implementing direction contained in FSM 2080 – Noxious Weed Management, which requires that a risk assessment for noxious weeds be completed for proposed actions that will result in ground disturbance.

The risk assessment uses five factors to analyze the risk of introducing or spreading weeds. The five factors are as follows:

Factor 1. Presence of known invasive plant species.

Factor 2. Habitat vulnerability based on previous disturbance, plant cover, soil cover, shade, soil type, aspect/moisture.

Factor 3. Non-project-dependent vectors such as existing roads and trails, traffic use, livestock/wildlife migrations, wind patterns, drainage flow direction.

Factor 4. Habitat alteration expected as a result of project such as logging prescriptions, road construction, fuels prescriptions, change in grazing management or recreation use, intensity and extent of disturbance.

Factor 5. Increased vectors as a result of project implementation such as road construction, facility construction, amount of project-related traffic.

The risk assessment can be found in the following *Environmental Consequences* section.

1995 Six Rivers National Forest Land and Resource Management Plan (Forest Plan)

The Forest Plan contains the following standards and guidelines for mitigating the introduction and spread of weeds:

- Invasive exotic species shall be prioritized and selected for management action based on their disruptive nature, distribution and the feasibility of successful control.
- Practices that prevent the introduction or spread of invasive exotic plant species shall be incorporated into planning and analysis for all management activities that have the potential to introduce or spread these species.
- Off-site materials (i.e. mulch, imported soil, construction materials) shall be screened for the presence of invasive exotic plant materials. Materials known to be free of invasive exotics, such as rice straw mulch, should be used wherever practicable.
- Site treated to eradicate invasive exotic plant species shall receive follow-up monitoring.
- Best management practices to prevent the introduction and spread of non-native species.

The *Forest Service National Strategic Framework for Invasive Species Management* (USDA 2013, framework) was developed in 2004 and updated in 2013 to guide the implementation of Executive Order 13112 and Forest Service policy (FSM 2900). In order to more fully implement the 2013 framework and associated law and policy, to improve coordination between all Six River's program areas and administrative units, and to provide invasive species prevention practices applicable to various forest and contractor activities, BMPs have been developed including one overarching prevention practice relative to aquatic invasive organisms. This document, *Best Management Practices: Invasive Plant Species and Aquatics Organisms, Six Rivers National Forest*, may be found in the Appendix D.

Effects Analysis Methodology

Noxious weed species considered in this analysis are those that occur on forest within the Smith River NRA within the travel management project boundary. They are listed in Table 3-77 below. The species being considered are invasive non-native plants that possess one or more of the characteristics of an invasive weed and are undesirable on national forest lands.

Based on Executive Order 13112, issued in 1999, a species is considered invasive if it: a) is nonnative to the ecosystem under consideration, and b) its introduction causes or is likely to cause economic or environmental harm or harm to human health. This analysis addresses invasive plant species from the California state agriculture department lists of noxious weeds (CDFA, NDA), and the California Invasive Plant Council list of invasive plants (CalIPC).

All of the weed species identified on the forest are of concern with regard to their potential to spread and threaten native ecosystems; however, the forest has prioritized weed species and infestations for treatment based on the aggressiveness of the weed species, whether or not the infestations are isolated satellite populations, the feasibility of control, and the degree of regional concern and cooperative efforts on the forest. Species that are rated *A* or *B* by CDFA, or CalIPC species[35] with a rating of *high*, or species for which the Humboldt-Del Norte Weed Management Area have rated as high priority are rated as high priority species for the purposes of this analysis. The potential spread of these species would constitute a moderate or high risk with regard to the requirements of FSM 2081.03.

Treatment of high priority species adjacent to routes effected by proposed actions is required, and is included in the route-specific description of alternatives in this FEIS. Control of all known infestations of lower priority species is not currently feasible, and they are likely to persist throughout the life of this project.

Assumptions specific to the noxious weed analysis:

1. Actions proposed herein are ground-disturbing activities requiring a weed risk assessment.
2. For action alternatives vehicle use on UARs proposed for addition to the NFTS will remain at current levels of light (less than 25 vehicle trips per week) or low (25 to 100 trips per week).
3. When completing this risk assessment, the following categories were assigned to individual routes to compare the effects of noxious weed spread or introduction from this project: high, medium, or low. These categories were assigned based on the following factors:
    a. The risk of introduction was considered high if a UAR was added to the NFTS as an open route or if a system road was changed from ML 1 (closed) to a higher level opening it to use. The risk of spread was considered high if a weed species present is rated as having a high potential to spread (see Table 3-77).
    b. The risk of spread or introduction was classified as medium if the weed species is not listed as highly invasive (this includes species with lower ratings on CalIPC and state lists,).
    c. The risk of introduction or spread was considered low if either the UAR is not proposed for addition to the NFTS, a road is being decommissioned, or the road is being closed (ML lowered to 1). The assumption of low risk is based on any existing weed sites on these routes being treated as a project mitigation.
4. In general, attempting to quantify effects associated with potential future use is speculative at best, as it is impossible to predict the level of use that will occur.

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[35] California Food and Drug Administration Weed Ratings:

High: These species have severe ecological impacts on physical processes, plant and animal communities, and vegetation structure. Their reproductive biology and other attributes are conducive to moderate to high rates of dispersal and establishment. Most are widely distributed ecologically.

Moderate: These species have substantial and apparent-but generally not severe-ecological impacts on physical processes, plant and animal communities, and vegetation structure. Their reproductive biology and other attributes are conducive to moderate to high rates of dispersal, though establishment is generally dependent upon ecological disturbance. Ecological amplitude and distribution may range from limited to widespread.

Limited: These species are invasive but their ecological impacts are minor on a statewide level or there was not enough information to justify a higher score. Their reproductive biology and other attributes result in low to moderate rates of invasiveness. Ecological amplitude and distribution are generally limited, but these species may be locally persistent and problematic.

5. The key to keeping noxious weeds at bay on the forest is management of the vectors that introduce weeds to our forest and continue their spread as well as management of satellite or leading edge occurrences.
6. Without mitigations and aggressive ongoing management existing weed infestations will likely spread and the rate of spread will increase in direct proportion to increases in time and increases in vehicular activity.
7. Infestations located along system roads, particularly those with mixed use, or inventoried UARs where vehicles drive will be spread along the roads and routes.
8. Motor vehicles will bring weed seeds and propagative parts into the project area from other areas where they have traveled.
9. There are potential beneficial effects in terms of preventing introduction and spread resulting from blocking and discontinuing use on system roads or UARs not added that have weed infestations. However, weed treatment of existing infestations is necessary prior to closure or barricading to avoid future spread on closed routes that will receive little management.
10. All roads and trails proposed to be open for use have the potential for the introduction of new weed sites from vehicles acting as vectors whether or not they are currently infested.
11. Direct effects occur within 30 feet of routes where vehicles could travel in the absence of natural barriers such as vegetation or steep topography.
12. Indirect effects, which occur from 30 to 100 feet from routes, are more likely to be greater under those alternatives that propose a higher mileage of routes open for motorized use and indirect effects are less for those alternatives that proposed a higher mileage of routes for closure.

Table 3-77. Invasive plant species of concern known to occur on the Smith River NRA.

Scientific Name	Common Name	CDFA Rating	Cal IPC Rating	Weed Management Area Priority Rating	Potential to Establish and Spread
Carduus acanthoides	Plumeless thistle	A	Limited	Not Rated	Low
Carduus pycnocephalus	Italian thistle	C	Moderate	Not Rated	Low
Centaura melitensis	tocalote	C	Moderate	Moderate	Low
Centaurea debeauxii	meadow knapweed	A	Moderate	High	High
Centaurea diffusa	diffuse knapweed	A	Moderate	High	High
Centaurea maculosa	spotted knapweed	A	High	High	High
Centaurea solstitialis	yellow starthistle	C	High	High	High
Chondrilla juncea	skeleton weed	A	Moderate	Not Rated	High
Cirsium arvense	Canada thistle	B	Moderate	Moderate	High
Cortaderia jubata	jubatagrass	B	High	High	High
Cortaderia selloara	pampasgrass	None	High	Not Rated	High
Cytisus scoparius	Scotch broom	C	High	High	High
Digitalis purpurea	foxglove	None	Limited	Not Rated	Moderate
Euphorbia esula	leafy spurge	A	Moderate	Alert	Moderate
Euphorbia oblongata	oblong spurge	B	Limited	Low	Moderate

Scientific Name	Common Name	CDFA Rating	Cal IPC Rating	Weed Management Area Priority Rating	Potential to Establish and Spread
Genista monspessulana	French broom	C	High	High	High
Hedera helix	English Ivy	None	High	High	High
Hypericum perforatum	klamathweed	C	Moderate	Moderate	Moderate
Isatis tinctoria	dyer's woad	B	Moderate	Not Rated	Low
Lepidium latifolium	perennial peppergrass	B	High	Not Rated	Low
Linaria dalmatica ssp. *Dalmatica*	Dalmatian toadflax	A	Moderate	Not Rated	Moderate
Onopordum acanthium	Scotch thistle	A	High	Not Rated	Moderate
Robinia pseudoacacia	black locust	None	Limited	Not Rated	Low
Senecio jacobaea	tansy ragwort	B	Limited	High	High
Silybum marianum	mild thistle	None	Limited	Not Rated	Moderate
Spartium junceum	Spanish broom	C	High	High	High
Taeniatherum caput-medusae	medusahead	C	High	High	High

Impacts relevant to noxious weeds:

- Noxious weeds are a serious environmental concern. They threaten natural diversity, habitat for fish, wildlife and native plants, soil stability, and ecosystem processes.
- The degradation of natural settings by noxious weeds negatively impacts recreational users.
- Noxious weeds can change fire regimes changing both the intensity of fires and the return interval.

Data Sources

The following data sources, along with referenced scientific sources, were relied upon to complete this analysis and represent a consideration of the best available science.

- Route inventories collected in Step 1 of Travel Management and associated tabular data sets.
- Existing noxious weed location data stored in a forest Microsoft Access database and in the Invasive Plants module of the National Resource Information System (NRIS) database.
- GIS layers of road inventories, serpentine and wetland habitats, botanical areas, RNAs, NAIP satellite imagery.
- Professional knowledge of noxious weed invasiveness and spatial distribution on the forest to determine which species and locations should be considered high priority for treatment based on feasibility of control.

Noxious Weed Methodology by Action

Direct and Indirect Indicators

Each action proposed will be evaluated in terms of its potential to lower the risk of introducing and spreading weeds.

Short-term timeframe: 1 year. Weed sites on forest are prioritized each year for treatment.

Long-term timeframe: 25 years. Project implementation, with respect to the inventory and treatment of weed sites and their eradication, will take many years to achieve. For broom species and tansy ragwort, this entails annual retreatment to deplete the seed bank. Although it is not known how long eradication will take, our best judgement deems it possible over a 20-year period.

Spatial boundary: Smith River NRA travel management project boundary within 100 feet of routes included in the action alternatives.

Methodology: GIS analysis of NFTS roads and inventoried UARs proposed for addition to the NFTS as roads proposed for change in status.

Rationale: The indicator addresses the potential to reduce the introduction and spread of weeds by motorized vehicles. Because roadside habitat is favorable to infestation and because vehicles serve as vectors, effects related to introduction and spread are less where the miles of road open for use are less. The distance where the effects of vehicle travel related to the introduction and spread of weeds may occur is estimated to be approximately 100 feet from existing routes.

1. Direct and indirect effects of designating inventoried UARs as open roads to the NFTS.
Indicator(s): Direct and indirect effects in terms of the risk of introducing and spreading weeds resulting from the designation of UARs as open roads to the NFTS is less where the number of miles of open UARS added is less.

2. Direct and indirect effects of designating inventoried UARs as motorized trails to the NFTS.
Indicator(s): Direct and indirect effects in terms of the risk of introducing and spreading weeds resulting from designating UARs as motorized trails to the NFTS is less where the number of miles of UARs added is less.

3. Direct and indirect effects of upgrading NFTS roads from ML 1 (closed) to ML 2 (open).
Indicator(s): Direct and indirect effects in terms of the risk of introducing and spreading weeds resulting from upgrading NFTS roads from ML 1 (closed) to ML 2 (open) is less where the number of miles of roads upgraded to an open status is less.

4. Direct and indirect effects of downgrading open NFTS roads from ML 2 to ML 1 closed.
Indicator(s): Direct and indirect effects in terms of the risk of introducing and spreading weeds resulting from downgrading open NFTS roads from ML 2 to ML 1 is less where the number of miles of roads downgraded is greater.

5. Direct and indirect effects of decommissioning NFTS roads.
Indicator(s): Direct and indirect effects in terms of the risk of introducing and spreading weeds resulting from decommissioning NFTS roads are less where the number of miles of NFTS roads closed through decommissioning is greatest.

6. Direct and indirect effects of barricading UARs not being added to the NFTS and barricading NFTS roads.
Indicator(s): Direct and indirect effects in terms of the risk of introducing and spreading weeds resulting from barricading UARs that are not being added to the NFTS and barricading NFTS roads that are being closed are less where the miles of UARs and roads proposed for barricading is greatest.

Cumulative Effects
Indicator(s): Risk of noxious weed spread.

Short-term timeframe: not applicable; cumulative effects analysis will be done only for the long-term timeframe.

Long-term timeframe: 25 years. Project implementation, with respect to the inventory and treatment of weed sites and their eradication, will take many years to achieve. For broom species and tansy ragwort, this entails annual retreatment to deplete the seed bank. Although it is not known how long eradication will take, our best judgement deems it possible over a 25-year period.

Spatial boundary: Smith River NRA. Road connectivity requires that the spatial boundary be extended beyond the project boundary to include all of the Smith River NRA. Introduction is most likely to come from Oregon and the most effective way to manage the threat is via inventory and treatment on Smith River NRA. The SRNF will continue to monitor for the introduction of the yellow tuft alyssum from Oregon where it is being actively managed.

Methodology: Review of current and future projects to determine the risk of introduction and spread of those weed species affected by the proposed actions.

The cumulative effects analysis herein will not attempt to quantify the effects of past human actions by adding up all prior actions on an action-by-action basis. Focusing on individual actions would be less accurate than looking at existing conditions, because there is limited information on the environmental impacts of individual past actions, and one cannot reasonably identify every action over the last century that has contributed to current conditions. By looking at current conditions, we are likely to capture the residual effects of past human actions and natural events, regardless of the particular action or event contributed those effects. For these reasons, the analysis of past actions is based on current environmental conditions.

Affected Environment

Current knowledge of weed species on the Smith River NRA is based upon weed inventory and mapping that has occurred since 1999. Serpentine areas on the Smith River NRA have a lower incidence of weed infestation than non-serpentine areas. The Idaho fescue grasslands that are associated with serpentine derived soils have relatively low infestations or lack infestation altogether and are some of the most pristine grasslands on the forest. Most of the weed infestations on the Smith River NRA are distributed along relatively well-traveled roads, along turnouts, near developments, and other disturbed areas. The level of weed infestations associated with roads tends to be directly proportional to the level of use and weeds are most abundant along US Highway 199, and alone county roads like French Hill road, Wimer road, South Fork road, and the Gasquet Toll road. In general, weed infestations tend to be heaviest where Forest Service roads intersect the state highway and county roads and weeds tend to be encountered less frequently the farther one moves from state and county roads. The infestations associated with the well-traveled routes tend to be too large to control via hand removal and are given a low priority. Infestations located away from these disturbance corridors represent the leading edge of weed advance or smaller satellite populations where efforts to stop the spread of weeds are most practical and where treatment is the highest priority.

Environmental Consequences

Several studies (Rooney 2003, Lippe and Kowarik 2006) have found that motorized vehicles did pick up and disperse weeds and that the probability of colonization increased with increasing traffic. They noted that many species have seed characteristics that predispose them for vehicular dispersal. Rooney recommended removing exotic species from a trail every year to reduce both the spread of weeds along the trail and to reduce the inter-trail colonization rate.

Impacts to native plants and changes in habitat can lead to the eventual replacement of native plant species with non-native species more adapted to frequent disturbances and altered soil conditions. Many invasive species have life forms that are adapted to persist in disturbed habitats such as roadsides and areas with frequent vehicle use. Compaction by vehicles also contributes to roadside invasions of exotic plant species by reducing native plant vigor and creating areas of competition-free space that are open to invasion (Trombulak and Frissell 2000). Trombulak and Frissell report the spread of exotics by vehicles through habitat alteration and creation or maintenance of movement corridors. Vehicle use may also result in a reduction in the vigor of native species, which can lead to an increased competitive advantage for exotics. Once established, many invasive plants tend to form monocultures, which exclude native plant species.

In heavily infested areas, weeds directly compete with native plants and can cause their local displacement. In addition, weeds can have a number of indirect effects. Potential impacts include alteration of disturbance regimes (including wildfire), loss of biodiversity, changes in the food base for wildlife species, soil erosion and loss of soil carbon storage, changes in soil moisture patterns, decreases in range or forest productivity, and altered recreational or aesthetic values. Weeds may also hybridize with native species altering native plant genetics. When native plants are replaced by weeds, the entire ecosystem can be impacted, including microbial flora and fauna and insect pollinators, all of which contribute to normal ecosystem function.

Effects from invasive species will continue to occur under all alternatives. Alternatives with fewer routes open for motorized vehicle use, especially those that exclude routes that are currently weed infested, provide a reduced risk for vectoring of seeds by motorized vehicles, a reduction in habitats susceptible to weed invasion, and a reduced opportunity for the spread of weeds to uninfested areas of the forest.

Cumulative Effects

An extensive cumulative effects project list was prepared for this analysis in July 2015 and appears elsewhere in this FEIS. The current and reasonably foreseeable future projects on forestlands in the analysis area, and the nature and extent of their potential effects on introducing and spreading noxious weeds include:

- **Timber activities and fuel treatments:** Effects are variable based on treatment: prescribed burning – partial removal of vegetation in the short term; mowing – partial removal of canopy, change in vegetation community structure, low growing plants left intact; thinning – change in vegetation community structure; and some crushing of vegetation associated with access and project implementation.
- **Wildland fire:** Wildland fire effects are similar to those described for prescribed burning, though in general wildland fires burn more intensely, potentially resulting in a more likely increase in weed abundance.
- **Fire suppression:** Fire suppression effects, due primarily to fuel break, safety zone and staging area construction, are similar to timber activity and fuel treatment effects although the effects are potentially greater due the emergency nature of these events that preclude planning to treat infestation prior to action.
- **Road and trail development or improvement, and urbanization:** Removal of vegetation; soil disturbance, erosion; impacts to hydrologic function, weeds predisposal for vehicular dispersal, creation of movement corridors.
- **Utility, irrigation, and highway easements:** Removal of vegetation, and soil disturbance in immediate vicinity of pipelines, ditches, highways; changes in vegetation condition within the easement due to utility line/highway/ditch maintenance; changes in hydrologic processes.

These activities are considered in the cumulative effects analysis because they may contribute to the introduction and spread of noxious weeds. The forest will continue to work toward the Agency goal of restoring forest and grasslands by reducing impacts from invasive species. Current and future ground disturbing actions proposed by the Forest Service will have a risk analysis completed for ground disturbing actions that will contain recommendations designed to mitigate the risk of introducing or spreading weeds from known sites. However, because the inventory of known sites on forest is not complete and because many known sites continue to persist in spite of repeated treatment, weeds will continue to spread and be introduced to uninfested areas on forest. The rate at which the forest is able to reduce the impacts from invasive species in the future is directly proportional to how effective management actions are in reducing the introduction and spread.

It is unknown what actions on private lands will contribute to cumulative effects. Actions on private lands where property owners are not actively managing weed infestations have a high risk of introducing and spreading weeds, especially if they occur on roads. Where NFTS roads pass through private land, high priority weed sites on private property within the Forest Service right-of-way are treated by the Forest Service to prevent their introduction and spread. Because the amount of private lands within the analysis area is relatively small and known high priority weed sites within the Forest Service right-of-way are receiving treatment, it is possible that over time there will be a reduction in risk of introduction and spread from private lands onto the forest.

Assessing Risk of Introduction or Spread of Noxious Weeds

The following risk assessment was developed to standardize the process for determining the risk of introducing or spreading noxious weeds associated with a proposed action. Note that inventory and mapping are essential prior to performing the risk assessment. For projects having a moderate to high risk of introducing or spreading noxious weeds, the project decision document must identify noxious weed control measures that must be undertaken during project implementation (2081.03).

Risk Assessment

Factor 1. Presence of known noxious weed species identified as a forest concern – High Risk

Table 3-78 displays the number of high priority weed sites, by species that are affected by the proposed actions. Sites listed are distinct units. For those roads listed, the risk of introduction and spread is high because of the presence of the known high priority weeds sites. The two broom species—Scotch broom and French broom—are listed as one species due to similar attributes and management. Weed species listed persist via a long-lived seed bank and vehicle tires are a recognized mechanism of dispersal (DiTomaso et. al. 2007). These species require repeated treatment in order to deplete the seed bank. Weed sites listed below have been treated repeatedly over the last 5 to 10 years and the low numbers shown are a product of the investment the forest has made in working toward eradicating these sites.

Table 3-78. Weed sites affected by the proposed actions.

Weed site Identifier	Number of Plants	Species	Location	Treat in Alternative
05105101PFB107A	9	broom	DN305	4, 5, 6
05105101PFB30	65	broom	15N01A	4
05105103CCS004A	1002	broom	18N16E	4, 5, 6
05105103CCS014A	69	broom	15N38	4, 5, 6
05105103CCS014C	20	broom	15N63	4, 5, 6
05105103PEB022	71	broom	427.103	4, 5, 6
05105103PEB026	178	broom	18N08	4, 5, 6
05105103PEB094	63	broom	16N19	4, 5, 6
05105103PEB096	5	tansy ragwort	17N41G.1	4, 5, 6
05105103PEB099	1	broom	17N41H	4, 5, 6
05105103TEC002	10	broom	18N20	4, 5, 6
05105104CCS004	18	broom	DN305	4, 6
05105104PEB025	5	broom	17N31	4, 5, 6
05105104PEB061	45	broom	DN315	4
05105104PEB084	67	broom	16N03K	4, 5, 6
05105104PEB112	7	broom	16N41	4, 5, 6
05105104PEB115	141	broom	16N38	4, 5, 6
05105104PEB123	11	broom	15N36	4, 5
05105104PEB128	1	broom	13N37	4, 5, 6
05105104PEB151	100	broom	18N19C	4, 5, 6
05105104PEB195	302	broom	18N17	4, 5, 6
05105104PEB259	116	broom	17N22J	4, 5, 6
05105105PEB219	31	broom	17N04S	4, 5, 6
05105199PFB5	74	broom	DN305	4

Weed site Identifier	Number of Plants	Species	Location	Treat in Alternative
51CEPR09DJG008	6	meadow knapweed	17N16	4, 5, 6
51COJU07CLS005	2	pampas grass	17N49	4, 5, 6
51CYSC07CLS001	85	broom	18N07	4
51CYSC09DJG009	280	broom	17N13A	4, 5, 6
51CYSC09TEC008	28	broom	427.106	4, 5, 6
51CYSC10TEC04	85	broom	17N48	4, 5, 6
51CYSC11CLS020	986	broom	17N05C	4, 5, 6
51CYSC11LDH003	228	broom	18N08	4, 5, 6
51CYSC12CLS013	5745	broom	18N07.2	4, 5, 6
51CYSC14JDM001	50	broom	DN315	4
51CYSC14LDH007	70	broom	17N36	4, 5, 6
51CYSC2006225	14	broom	18N08.2	4, 5, 6
51GEMO09TEC014	282	broom	17N15A	4, 5, 6
51GEMO10DMD023	25	broom	15N36	4, 5
51SEJA08JDM01	200	tansy ragwort	18N20.100	4, 5, 6
51SEJA13LDH001	13	tansy ragwort	17N26	4, 5, 6

Factor 2. Habitat vulnerability based on previous disturbance, plant cover, soil cover, shade, soil type, aspect/moisture – High Risk

The risk of introduction and spread is high for motorized trails and roads due to the vulnerability of roadside habitat.

Factor 3. Non-project-dependent vectors such as existing roads and trails, traffic use, livestock/wildlife migrations, wind patterns, drainage flow directions – High Risk

The risk of introduction and spread is high due to the network of roads in the project area.

Factor 4. Habitat alteration expected as a result of the project such as logging prescriptions, road construction, fuels prescriptions, change in grazing management or recreation use, intensity and extent of disturbance – Moderate Risk

The risk of introduction and spread from habitat alteration is moderate. The UARs and roads covered by the analysis are existing. The installation of barricades, waterbars and gates will result in short term disturbance contributing to the moderate risk rating. It is assumed that the level of use will remain low.

Factor 5. Increased vectors as a result of project implementation such as road construction, facility construction, amount of project-related traffic – High Risk

The risk of introduction and spread from increased vectors due to project implementation are high. The amount of project related traffic is expected to increase. Aggregate and other off site materials will be imported into the project area that could harbor weed propagules.

Determination of Risk

The aforementioned factors vary only somewhat in their risk of introduction and spread. The analysis of the five factors indicates a high risk for introduction and spread of noxious weeds. Policy (2081.03) states that when any ground-disturbing action or activity is proposed, the risk of introducing or spreading noxious weeds associated with the proposed action needs to be determined. For projects having moderate to high risk of introducing or spreading noxious weeds, the project decision document must identify noxious weed control measures that must be undertaken during project implementation.

Noxious Weed Control Mitigations Common to All Action Alternatives

It is recommended that the following measures be incorporated into the decision document to reduce the risk of weed introduction and spread. Weed sites displayed in Table 3-78 will be removed by hand and weed propagules (seeds) shall be removed from the forest or burned. Time removal activities prior to plants producing seed to avoid spread during treatment. The weed species will require repeated treatment over time to remove the seed bank. Of particular concern, due to their persistence are the meadow knapweed on 17N16 and the tansy ragwort on 17N26, 17N41G.1 and 18N20.100. These species will require repeated treatment annually, over time, to achieve control. The most effective time to hand pull these species is when the ground is moist. Treatment in the spring followed by removal after the first ground-soaking rains is the most effective way to remove the plants in their entirety and to reduce the seed bank. Treatment shall reoccur annually until weed sites are eradicated. All routes should be monitored over time to avoid reinfestation. System roads that are proposed to have heavy equipment work such as restoration of hydrological function, decommissioning, barricading, or culvert replacement that have weed infestations should have weeds removed prior to commencing work. Additionally equipment used in implementation should be cleaned prior to entering the forest and, if weed infestations are found to be present equipment should be cleaned upon leaving infested roads to avoid dispersing the weed seed to other areas of the forest. Any imported mulch or other erosion control material should come from a certified weed free source.

It is recommended that routes in Table 3-78 that are proposed for closure be treated to remove weed infestations. It is recommended that weed sites are hand pulled prior to commencing any work leading up to closure. All sites noted should have certified weed free mulch (i.e. wood straw or wood chips) installed to impede subsequent germination of the weed seed bank. Vehicles should be cleaned to remove weed propagules prior to leaving site. Introduction and spread of these infestations will continue in the absence of mitigations. Because of their knowledge of the weed sites listed, a botanist should be consulted when developing an implementation plan for closure. The weed sites listed have been treated multiple times and are a high priority for treatment.

Use of mulch, such as wood straw or mulch from chipped or masticated native material, is preferable to imported materials that may be weed contaminated. Ensure rock, boulders, sand or other material used for project implementation originate from a weed-free source. Sources for these materials shall be inspected by staff trained in invasive plant identification or documented by contractor that material is weed-free. Borrow material from weed-infested stockpiles should not be used. Where determined to be appropriate, use clauses requiring contractors or permittees to clean their equipment prior to entering NFS lands.

Alternative 1 – No action

Direct and Indirect Effects

1. Direct and indirect effects of designating inventoried UARs as open roads to the NFTS.

Indicator(s): Direct and indirect effects in terms of the risk of introducing and spreading weeds resulting from the designation of UARs as open roads to the NFTS is less where the number of miles of UARS added is less.

- 1. Miles of UARs designated as open roads to the NFTS = 0.00 miles.

2. Direct and indirect effects of designating inventoried UARs as motorized trails to the NFTS.

Indicator(s): Direct and indirect effects in terms of the risk of introducing and spreading weeds resulting from designating UARs as motorized trails to the NFTS is less where the number of miles of UARs added is less.

- 2. Miles of UARs designated as motorized trails to the NFTS = 0.00 miles.

3. Direct and indirect effects of upgrading NFTS roads from ML 1 (closed) to ML 2 (open).

Indicator(s): Direct and indirect effects in terms of the risk of introducing and spreading weeds resulting from upgrading NFTS roads from ML 1(closed) to ML 2 (open) is less where the number of miles of roads upgraded to an open status is less.

- 3. Miles of NFTS roads upgraded from ML 1 to ML 2 = 0.00 miles.

4. Direct and indirect effects of downgrading open NFTS roads from ML 2 (open) to ML 1 (closed).

Indicator(s): Direct and indirect effects in terms of the risk of introducing and spreading weeds resulting from downgrading open NFTS roads from ML 2 (open) to ML 1 is less where the number of miles of roads downgraded is greater.

- 4. Miles of NFTS roads downgraded from ML 2 to ML 1 = 0.00 miles.

5. Direct and indirect effects of decommissioning NFTS roads.

Indicator(s): Direct and indirect effects in terms of the risk of introducing and spreading weeds resulting from decommissioning NFTS roads are less where the number of miles of NFTS roads closed through decommissioning is greatest.

- 5. Miles of NFTS roads closed through decommissioning = 0.00 miles.

6. Direct and indirect effects of barricading UARs not being added to the NFTS and barricading NFTS roads.

Indicator(s): Direct and indirect effects in terms of the risk of introducing and spreading weeds resulting from barricading UARs that are not being designated to the NFTS and barricading NFTS roads that are being closed are less where the miles of UARs and roads proposed for barricading is greatest.

- 6. Miles of UARs and roads proposed for barricading = 0.00 miles.

Alternative 4

Direct and Indirect Effects

1. Direct and indirect effects of designating inventoried UARs as roads to the NFTS that are open to use.

Indicator(s): Direct and indirect effects in terms of the risk of introducing and spreading weeds resulting from the designation of UARs as open roads to the NFTS is less where the number of miles of UARS added as open roads is less.

- 1. Miles of UARs designated as open roads to the NFTS = 12.65 miles.

2. Direct and indirect effects of designating UARs as motorized trails to the NFTS.

Indicator(s): Direct and indirect effects in terms of the risk of introducing and spreading weeds resulting from designating UARs as motorized trails to the NFTS is less where the number of miles of UARs added as motorized trails is less.

- 2. Miles of UARs added as motorized trails to the NFTS = 58.18 miles.

3. Direct and indirect effects of upgrading NFTS roads from ML 1 (closed) to ML 2 (open).

Indicator(s): Direct and indirect effects in terms of the risk of introducing and spreading weeds resulting from upgrading NFTS roads from ML 1 (closed) to ML 2 (open) is less where the number of miles of roads upgraded to an open status is less.

- 3. Miles of road upgraded from ML 1 to ML 2 = 11.05 miles.

4. Direct and indirect effects of downgrading open NFTS roads from ML 2 to ML 1 closed.

Indicator(s): Direct and indirect effects in terms of the risk of introducing and spreading weeds resulting from downgrading open NFTS roads from ML 2 to ML 1 is less where the number of miles of roads downgraded to a closed status is greater.

- 4. Miles of NFTS roads downgraded from ML 2 to ML 1 = 16.37 miles.

5. Direct and indirect effects of decommissioning NFTS roads.

Indicator(s): Direct and indirect effects in terms of the risk of introducing and spreading weeds resulting from decommissioning NFTS roads are less where the number of miles of NFTS roads closed through decommissioning is greatest.

- 5. Miles of NFTS roads decommissioned = 53.62 miles.

6. Direct and indirect effects of barricading UARs not being added to the NFTS and barricading NFTS roads.

Indicator(s): Direct and indirect effects in terms of the risk of introducing and spreading weeds resulting from barricading UARs that are not being added to the NFTS and barricading NFTS roads that are being closed are less where the miles of UARs and roads proposed for barricading is greatest.

- 6. Miles of UARs and roads proposed for barricading = 65.94 miles.

Alternative 5

Direct and Indirect Effects

1. Direct and indirect effects of designating inventoried UARs as roads to the NFTS.

Indicator(s): Direct and indirect effects in terms of the risk of introducing and spreading weeds resulting from the addition of UARs as open roads to the NFTS is less where the number of miles of UARS added is less.

- 1. Miles of UARs added as open roads to the NFTS = 2.63 miles.

2. Direct and indirect effects of designating UARs as motorized trails to the NFTS.

Indicator(s): Direct and indirect effects in terms of the risk of introducing and spreading weeds resulting from designating UARs as motorized trails to the NFTS is less where the number of miles of UARs added is less.

- 2. Miles of UARs added as motorized trails to the NFTS = 7.39 miles.

3. Direct and indirect effects of upgrading NFTS roads from ML 1 (closed) to ML 2 (open).

Indicator(s): Direct and indirect effects in terms of the risk of introducing and spreading weeds resulting from upgrading NFTS roads from ML 1(closed) to ML 2 (open) is less where the number of miles of roads upgraded to an open status is less.

- 3. Miles of road upgraded from ML 1 to ML 2 = 4.21 miles.

4. Direct and indirect effects of downgrading open NFTS roads from ML 2 to ML 1 closed.

Indicator(s): Direct and indirect effects in terms of the risk of introducing and spreading weeds resulting from downgrading open NFTS roads from ML 2 to ML 1 is less where the number of miles of roads downgraded is greater.

- 4. Miles roads downgraded from ML 2 to ML 1 = 54.33 miles.

5. Direct and indirect effects of decommissioning NFTS roads.

Indicator(s): Direct and indirect effects in terms of the risk of introducing and spreading weeds resulting from decommissioning NFTS roads are less where the number of miles of NFTS roads closed through decommissioning is greatest.

- 5. Miles of NFTS roads decommissioned = 110.35 miles.

6. Direct and indirect effects of barricading UARs not being added to the NFTS and barricading NFTS roads.

Indicator(s): Direct and indirect effects in terms of the risk of introducing and spreading weeds resulting from barricading UARs that are not being added to the NFTS and barricading NFTS roads that are being closed are less where the miles of UARs and roads proposed for barricading is greatest.

- 6. Miles of UARs and roads proposed for barricading = 133.40 miles.

Alternative 6

Direct and Indirect Effects

1. Direct and indirect effects of designating inventoried UARs as roads to the NFTS.

Indicator(s): Direct and indirect effects in terms of the risk of introducing and spreading weeds resulting from the addition of UARs as open roads to the NFTS is less where the number of miles of UARS added is less.

- 1. Miles of UARs added as open roads to the NFTS = 4.74 miles.

2. Direct and indirect effects of designating UARs as motorized trails to the NFTS.

Indicator: Direct and indirect effects in terms of the risk of introducing and spreading weeds resulting from designating UARs as motorized trails to the NFTS is less where the number of miles of UARs added is less.

- 2. Miles of UARs added as motorized trails to the NFTS = 44.18 miles.

3. Direct and indirect effects of upgrading NFTS roads from ML 1 (closed) to ML 2 (open).

Indicator(s): Direct and indirect effects in terms of the risk of introducing and spreading weeds resulting from upgrading NFTS roads from ML 1 (closed) to ML 2 (open) is less where the number of miles of roads upgraded to an open status is less.

- 3. Miles of roads upgraded from ML 1 to ML 2 = 4.22 miles.

4. Direct and indirect effects of downgrading open NFTS roads from ML 2 to ML 1 closed.

Indicator(s): Direct and indirect effects in terms of the risk of introducing and spreading weeds resulting from downgrading open NFTS roads from ML 2 to ML 1 is less where the number of miles of roads downgraded is greater.

- 4. Miles of NFTS roads downgraded from ML 2 or ML 3 to ML 1 = 21.31 miles.

5. Direct and indirect effects of decommissioning NFTS roads.

Indicator(s): Direct and indirect effects in terms of the risk of introducing and spreading weeds resulting from decommissioning NFTS roads are less where the number of miles of NFTS roads closed through decommissioning is greatest.

- 5. Miles of NFTS roads decommissioned = 53.63 miles.

6. Direct and indirect effects of barricading UARs not being added to the NFTS and barricading NFTS roads.

Indicator(s): Direct and indirect effects in terms of the risk of introducing and spreading weeds resulting from barricading UARs that are not being added to the NFTS and barricading NFTS roads that are being closed are less where the miles of UARs and roads proposed for barricading is greatest.

- 6. Miles of UARs and roads proposed for barricading = 92.84 miles.

Summary of Effects Analysis across All Alternatives

The following table was derived from the effects analysis completed above. Alternatives that lower the risk of introduction and spread to low by receive the highest indicator ratings, as shown in Table 3-79 and Table 3-80. Reducing the amount of open roads would lower the risk of introduction and spread.

Table 3-79. Summary of indicators by alternative.

Alternative	Miles of UARs added as open roads to the NFTS	Miles of UARs added as motorized trails to the NFTS	Miles of NFTS road upgraded from ML 1 to ML 2	Miles of road downgraded from ML 2 or 3 to ML 1	Miles of NFTS roads closed through decommissioning	Miles of UARs and roads proposed for barricading
Alternative 1	0.00	0.00	0.00	0.00	0.00	0.00
Alternative 4	12.65	58.18	11.05	16.37	53.62	65.95
Alternative 5	2.63	7.39	4.22	54.33	110.35	133.40
Alternative 6	4.74	44.18	4.21	21.31	53.63	92.84

Table 3-80. Indicator scoring for noxious weeds by alternative.

Indicators	Ranking of Alternatives			
	Alt 1	Alt 4	Alt 5	Alt 6
1. Miles of UARs added as open roads to NFTS	4	1	3	2
2. Miles of UARs added as motorized trails to NFTS	4	1	3	2
3. Miles of NFTS road upgraded from ML 1 to ML 2	4	1	3	2
4. Miles of road downgraded from ML 2 to ML 1.	1	2	4	3
5. Miles of NFTS roads closed through decommissioning.	1	2	4	3
6. Miles of UARs and roads proposed for barricading.	1	2	4	3
Indicator Score Summation[36]	***15***	***9***	***21***	***15***

Based on the above analysis, Alternative 5 reduces the risk of introduction more than the other alternatives (Table 3-81).

Table 3-81. Comparison of effects of lowering the risk of introducing and spreading weeds.

Indicator	Rankings of Alternatives for Each Indicator[37]			
	Alt 1	Alt 4	Alt 5	Alt 6
Reducing the risk of introduction and spread of weeds.	3	2	4	3

Compliance with the Forest Plan and Other Direction

All proposed actions are incompliance with the *Forest Service National Strategic Framework for Invasive Species Management* (USDA 2013) and the *Best Management Practices: Invasive Plant Species and*

[36] The highest Indicator Score Summation indicates the alternative has the highest potential to reduce the risk of introduction and spread of noxious weeds related to the indicator. The lowest Indicator Score Summation indicates the alternative has the lowest potential to reduce the risk of introduction and spread of noxious weeds related to the indicator.

[37] A score of 4 indicates the alternative has the highest potential to reduce the risk of introduction and spread of noxious weeds related to the indicator. A score of 1 indicates the alternative has the lowest potential to reduce the risk of introduction and spread of noxious weeds related to the indicator.

Aquatics Organisms, Six Rivers National Forest provided that the noxious weed control mitigations common to all action alternatives are implemented. These mitigations are designed to reduce the risk of introduction and spread to a low risk rating.

Port-Orford-Cedar

Introduction

Management activities on NFS lands are planned and implemented to maintain Port-Orford-cedar (*Cupressus lawsoniana*; POC), considered an ecologically, economically, and culturally important tree species (FSM 2670.22). The conservation and management of viable populations of POC throughout their geographic range is central to the conservation of much of the biodiversity that occurs on serpentine substrates in the Klamath-Siskiyou Mountains of southwest Oregon and northwest California, limited to a 220-mile stretch (350 km) from north to south. Port-Orford-cedar occupies a broad environmental range and is associated with some of the most diverse plant types in the region (Jimerson and Creasy 1991).

On the SRNF, POC occurs on the Smith River NRA, and the Orleans and Lower Trinity ranger districts. Of the 28,759 acres of POC on the SRNF (USDA 2012), 20,344 acres (70 percent) are on the Smith River NRA. The primary threat to the viability of POC is the introduction and spread of *Phytophthora lateralis* (PL), a root disease that infects and kills POC. In 1923, this pathogen was first noted to cause disease on nursery stock near Seattle, Washington. By 1952, PL was introduced into natural stands and has since spread leading to mortality of this tree species throughout its range.

The disease spreads primarily in the late fall through early spring, with the movement of spores in water, in the mud from infected sites, or by root-to-root contact (Roth et al. 1987). Motorized vehicle and equipment use represent primary PL spread vectors alongside expansive road and trail system networks on NFS land. Typically, spores cling to the wet mud and water spray transported on the undercarriage, wheels or mud flaps of vehicles that drive through or near infested sites.

In the late 1980s and early 1990s, increased public awareness of the accelerated rate of spread of PL from OHV use compromising the health and survival of native POC, prompted new land management direction aimed at better controlling this disease (Forest Plan Appendix A 1995). Concurrently, the FS increased their efforts to reduce new occurrences of PL by seasonally gating and closing roads, washing equipment before entering NFS land and other measures. In 1986, an interregional, interagency POC coordinating group was formed by the Forest Service and Bureau of Land Management (BLM) to coordinate all activities affecting POC within and between FS Regions 5 and 6, and the BLM. These agreed upon practices restricting motor vehicle use have been effective in slowing the rate of spread of PL, but other dispersal vectors such as animals, hunters, and other ownership practices, even where there are no roads, continue to spread PL.

The following sections disclose the risk analysis used to determine the potential effects to POC plant communities for the No Action alternative and the action alternatives considered in detail (Alternatives 4, 5 and 6). The three major key risk measurement indicators used to predict effects to POC plant communities include 1) routes (OHV roads and trails) proposed for designation in proximity to the presence of the disease; 2) the distance of roads to mapped POC; and 3) the nearby presence of water sources and streams. Additional risk factors include POC stand density, presence of root disease in watershed and catchment area (Jules et al. 2002).

All the action alternatives recognize the importance of managing the timing, environmental conditions and locations of public road use to minimize the introduction and spread of PL to minimize impacts to POC.

Analysis Framework: Statute, Regulation, Forest Plan and Other Direction

Land management direction relevant to the management of Port-Orford-cedar includes:

- Maintain viable populations of all native and desired non-native wildlife, fish, and plant species in habitats distributed throughout their geographic range on NFS lands (FSM 2670.22).
- Avoid or minimize impacts to species whose viability has been identified as a concern (FSM 2670.32).
- If impacts cannot be avoided, analyze the significance of potential adverse effects on the population or its habitat within the area of concern and on the species as a whole (FSM 2670.32)

While not regulatory, the following documents give guidance to the management of POC:

Port-Orford-Cedar Record of Decision and Forest Plan Amendment for Management of Port-Orford-Cedar in Southwest Oregon, Siskiyou National Forest (2004)

To ensure consistency between Region 5 and Region 6, the risk analysis methodology protocol was used for assessing and assigning POC risk ratings to routes (Chapters 3 and 4).

Managing for Healthy Port-Orford-Cedar in the Pacific Southwest Region (2007)

A summary of the status of POC root disease in the Region and the integrated strategies that should be considered to improve POC survival in California’s forests. It provides updated BMPs that forest managers may consider incorporating into project level planning and/or Forest Plan amendments and revisions.

Port-Orford-Cedar Program Status Report (2007)

This was prepared as part of the Region 6 Action Plan in response to the 2006 Washington Office (WO) Review of Region 6’s Forest Health Protection program. At the request of the WO, the Status Report included POC management in Region 5. One recommendation of the Status Report was to manage POC under a single management strategy on all Forest Service-administered lands. The recommendation was that direction from the POC ROD and Forest Plan Amendment for Management of POC in southwest Oregon on the Siskiyou National Forest should be adopted by all other forests with POC at the time their forest plans are revised (or earlier if convenient).

1995 Six Rivers National Forest Land and Resource Management Plan (Forest Plan)

- Trees with Special Management Considerations (pp. II-7 and III-16)
- Standards and Guidelines (pp. IV-51 and IV-53)

- Management Area 11 – Special Regeneration (p. IV-54)
- Forest-wide Direction – Pest Management (p. IV-129, p. IV-130, p. V-20)
- Appendix H (p. H-9) and Appendix K (pp. K-4 – K-7)

Effects Analysis Methodology

Assumptions Specific to Port-Orford-Cedar

The primary method of introducing PL into an un-infected watershed is through PL infected mud on undercarriage, wheels or mud flaps of vehicles that fall near the stand of POC. The following assumptions are specific to POC and POC root disease:

- If infected mud is present, the risk that POC will be infected depends on several factors listed on page 131 in A Range-Wide Assessment of Port-Orford-Cedar on Federal Lands – BLM (USDI, USDA Forest Service 2003).
- Of the factors referenced above, the following were used to evaluate and determine risk ratings for routes within a watershed containing POC[38]:
    - Distance to POC,
    - Proximity to stream or water source, and
    - Infestation status.
- High risk was given to routes with the following conditions[39]:
    - Routes crossing streams with POC less than 300 meters downstream of crossing,
    - Routes passing upslope of POC stands, not crossing streams and occurring less than 50 feet from nearest tree, and
    - Routes passing less than 50 feet of currently infected POC stand.
- Once the root disease was established in a POC stand, the disease would either work its way downstream infecting adjacent POC stands immediately next to the watercourse or infect nearby stands from root-to-root contact.
- Trees having roots growing within newly infected streams downstream of the infestation site die quickly, generally less than 5 years, and tree mortality occurs much more slowly through root-to-

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[38] Though not directly related to rating a route's risk, POC plant associations (Jimerson and Daniel, 1994) were considered as a risk factor in the effects analysis. Gates or seasonal closures were not considered in rating a route's risk but were used as mitigating risks in the effects analysis. Watershed catchment area is also correlated with increased risk (Jules et al., 2002). This was not used in the risk model, but it was used to evaluate increased potential effects to stands of POC downstream by separating acres infected and the percentage of infected within 7th field watersheds. In this way by summing acres of POC stands that occur downstream of an infestation site in similar 7th-field watersheds, within the same stream network, the cascading effect of infestation flowing downstream could be more accurately determined.

[39] The original GIS model used 100' as the distance of POC to a route crossing upstream. Jules et al. (2002) found that at 200 meters there was a 10 percent chance of infestation and almost no change of infestation at 400 meters. A five percent probability of infection or higher was classified as High Risk based on the Region 6 POC 2002 protocol. Because of this, 300 meters was used to estimate 5 percent risk.

root contact. Tree size, proximity to streams and tree density also affect the probability of infection (Jules et al. 2014).

- Gates and other barriers used to stop motor vehicle traffic are not 100 percent effective.
- Mitigations designed to reduce the spread of POC root disease are not equal. For instance, to prevent the disease from being introduced into currently uninfected areas, mitigations are designed to prevent motor vehicle traffic from entering into this area. In contrast, areas that are already heavily infected may be mitigated by improving the road surface to minimize the transport of infected mud from the area.

Data Sources

Spatial data sources used for this analysis are listed in Table 3-82.

Table 3-82. Spatial data used for the analysis and a brief description of each data set.

Layer Name	Description
2009 and 2012 NAIP; 2014 google earth imagery	1-meter color digital imagery
NRA_POC_2010	2010 POC (post Biscuit Fire)
NRA_POC_1999	1999 POC (pre-Biscuit Fire)
NRA_HUC7	7th field watershed
NRA_HUC6	6^{th}-field watershed
NRA_Stream_arc_83	Streams (all order classes)

Risk Analysis Methodology

A landscape-level range-wide risk analysis for POC plant associations was done for watersheds containing POC on the Gasquet Ranger District (Jimerson and Jones 2002). This risk analysis rated individual roads, motorized trails, and the potential for each of these routes to infect POC stands. It also rated the POC plant communities' susceptibility (low, moderate and high) to the introduction of POC root disease at a watershed scale. Risk was based on a POC's relative distance to the nearest road, its landscape position, plant association, and if access was gate-restricted.

The Six Rivers, Shasta-Trinity and Klamath national forests (Region 5) have since adopted the POC-risk assessment developed for the Siskiyou National Forest (Region 6), in the *Final Supplemental Environmental Impact Statement for Management of Port-Orford-Cedar in Southwest Oregon* (USDA and USDI, 2004), for consistency between administrative units. This risk assessment differs from the 2002 risk assessment as it uses a GIS model to assign POC-root-disease risk to individual stands accessed by roads and motorized trails, instead of stands put at risk at the watershed level. The identification of roads and motorized trails that put POC stands at risk was used as a coarse filter to identify needs for further analysis.

An even finer analysis than the Region 6 protocol was used for this project by visually verifying all GIS POC polygons, using 2009 and 2012 NAIP color digital imagery to capture possible roads and motorized trails that may have been missed with the model or routes incorrectly identified as high risk due to inaccurate GIS data. Once high-risk roads and motorized trails, including UARs, had been identified based on the GIS analysis, fieldwork was then done to verify the risk. The three factors most affecting risk used in the model were the nearby presence of the disease, the distance of roads to mapped POC, and the nearby presence of water. Similar to the 2002 risk assessment, plant community characteristics were considered as a contributing factor, along with road surface composition.

To more accurately determine acres of uninfected stands of POC in upper watersheds and minimize the cascading effect of PL as it works its way downstream, this analysis was done at the smaller, 7th-field watershed scale. There are seventy-seven 7th-field watersheds containing POC on the Smith River NRA, of which 69 are within the analysis area (Figure 3-8).

Many factors influence the probability of PL transmission resulting in POC infection (USDA, USDI 2004). Each factor carries with it a risk probability between 1 (very low) and 10 (very high) (Table 3-83; USDA, USDI 2004). These risk probabilities allow for a comparative quantitative analysis of factors that influence the spread of PL the most. This analysis followed USDA, USDI (2004) protocol, which defined risk probabilities greater than 3 (>5 percent risk) as high risk.

Motorized vehicles have the greatest influence on the spread of PL, with OHV having a higher risk probability (RP 8) than passenger vehicles (RP 7). Roads and motorized trails that cross streams or where wet surface conditions are present, with POC growing nearby downslope, also have a higher risk probability. The distance from a road to a POC stand is also a risk factor—the smaller the distance from a road to a POC stand, the greater the risk of PL infection (Jules et al. 2002; USDA, USDI 2004). In addition, the risk of PL infection appears to diminish from RP 8 to RP 4 (USDA, USDI 2004) for some POC stands growing as little as 10 feet from the road when compared to stands growing immediately adjacent to the road.

In the draft POC analysis, the following criteria were used to designate roads and motorized trails as high risk of introducing PL into a POC stand: a route crossing a stream with POC downstream within 100 feet (RP 4) and a route where the nearest downslope or flat-surface POC is less than 50 feet (RP 4). However, in the final analysis, a more conservative approach was used after reviewing 2012 imagery that showed a newly infected area within a stream course over 500 feet downstream from the nearest road. This was consistent with Jules et al. (2002) that documented one infected streamside tree 165 meters (541 feet) from the nearest road. The Jules et al. model predicted a 10 percent chance of infection at 200 meters (656 feet) and almost no chance of infection at 400 meters (1,312 feet). During a phone conversation with Professor Jules on December 15, 2014, he inferred that a 300-meter distance (984 feet) could represent a 5 percent chance of POC root disease infection.

To be consistent, POC stands downstream of a watercourse and within 300 meters of a roads and motorized trails were initially assigned a *high-risk* rating. These routes were visually checked using 2012 color NAIP and 2013 Google™ Earth imagery to visually inspect known POC stands growing downstream of routes crossing streams and using the distance tool in GIS to see if the stands were within the high-risk distance. Most roads and motorized trails were also field verified, although some were determined to be low risk after field verification. This occurred due to GIS spatial inaccuracies (incorrect mapping of streams and/or road locations) or because POC did not grow within 300 meters from the road to qualify it as high risk.

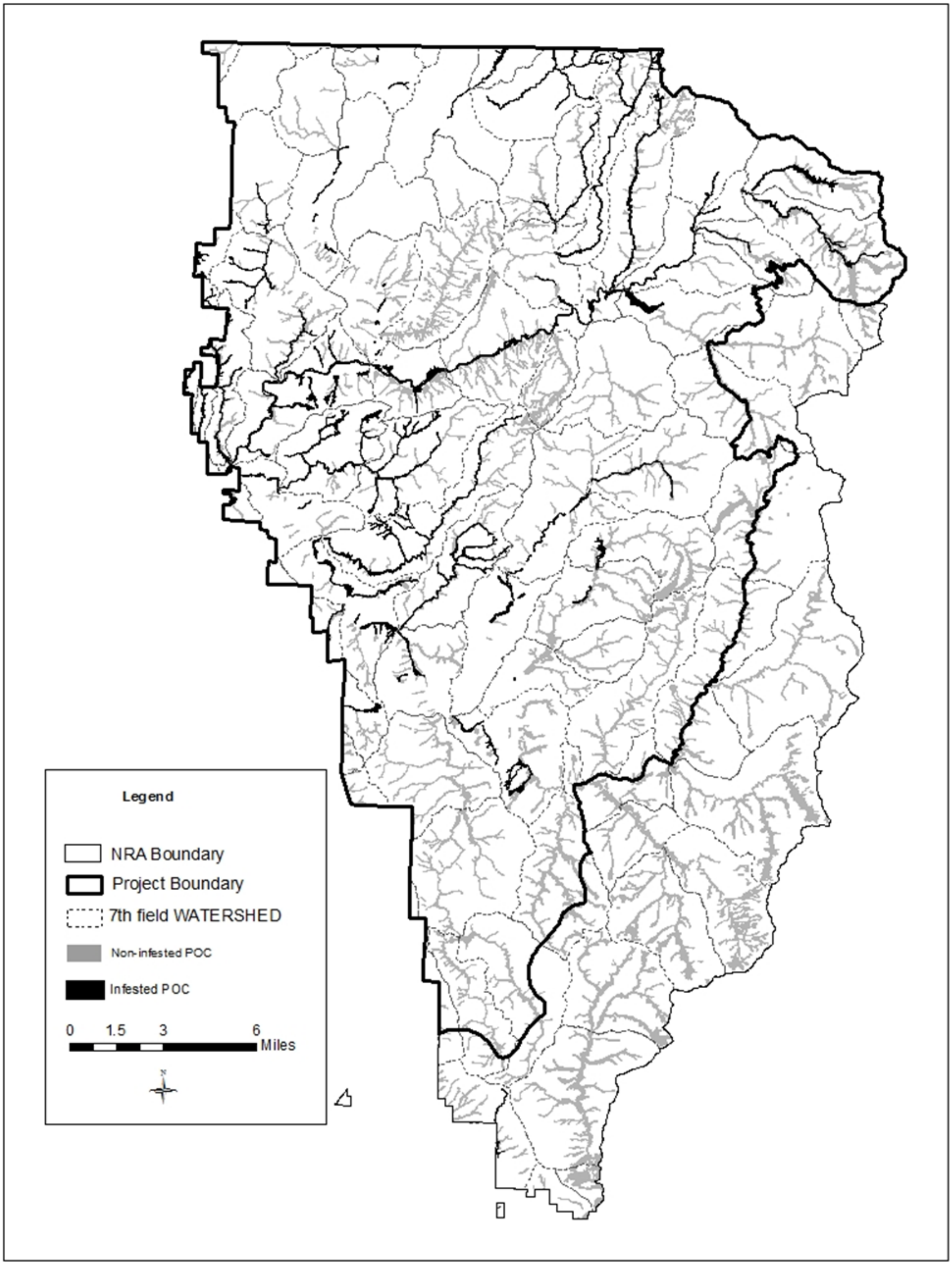

Figure 3-8. Port-Orford-cedar within the Smith River NRA 7th-field watersheds.

Other factors that influence risk of infection within a stream course include tree size, proximity to stream course, POC stand density, stream flow water levels, and the presence of root disease in the watershed and catchment area (Jules et al. 2002, Kauffman and Jules 2006). However, it should be noted that Jules et al. is only one study that quantifies relative risk probability as a function of stream distance, and more data would improve the estimate at what distance risk drops to low. It should be noted that these risk probabilities are for a single event. Low risk probability events can become riskier if repeated, especially if repeated often over a short time period.

It is important to note that the risk analysis was based on POC stands in relationship to motor vehicle travel courses and stream networks. All mitigation measures proposed in the various alternatives, including barricades, gates, seasonal road closures, and road surface and drainage improvements did not factor into the initial analysis of risk. They were, however, included in the effects section to show how each alternative reduced the degree of risk, which is primarily a function of the ability to successfully restrict motor-vehicle traffic into areas that have uninfected POC.

Table 3-83. Risk probabilities for factors associated with *Phytophthora lateralis* spread.

Relative Risk Probabilities for a Single Event				
1 = 0 to 2%	3 = 4.1 to 6%	5 = 8.1 to 10%	7 = 20.1 to 30%	9 = 40.1 to 50%
2 = 2.1 to 4%	4 = 6.1 to 8%	6 = 10.1 to 20%	8 = 30.1 to 40%	10 = 50.1 to 100%

Port-Orford-Cedar Resource Indicators

Number of times high-risk road or route directly accessed uninfected POC stands or indirectly accessed them by crossing a water source within 300 meters upstream of POC stands.

One of the greatest risks of transporting infested soil into uninfested areas is by unrestricted motor vehicle use, especially when road conditions are wet. Stream crossings and other wet area road crossings with POC growing downstream pose very high risk vector points for the disease into uninfected stream courses. Because of this, the number of road crossings where conditions like this occur are one measure for quantifying risk of disease spread. There is no linear correlation between this indicator and disease spread. It is only a proxy for quantifying relative increase or decrease of risk to disease introduction into streams containing POC.

Acres of POC by management action (mitigation) at increased risk in 7th-field watersheds.

Management action refers to mitigations put in place that would reduce the risk of disease spread. These include improvements to road surfaces, such as applying gravel and improving culverts, to reducing the movement of motor vehicle traffic into an uninfected area. This could be done with physical barricades, natural vegetation growth, and gates, both seasonal and permanent. This indicator is being used to show the relative risk reduction of each mitigation. On a spectrum of the greatest risk to the least risk, unrestricted road use is the greatest risk and complete road blockage where motor vehicle access is not even possible is the least risk. The diagram below displays a continuum of risk.

Least Risk ***Greatest Risk***

Impassable Barricade ***Permanent Gate*** ***Seasonal Gate*** ***Road Improvement*** ***Unrestricted Use***

These management mitigation actions are not quantitative but demonstrate increased or decreased risk associated with spreading POC root disease when compared to one another. Using this indicator for routes accessing POC stands gives a relative measure of determining the quantity (acres) of POC at risk. For example, when comparing a route with different mitigations, a route with a permanent barrier that prevents motor vehicle traffic from accessing uninfected POC in a watershed would have less risk of introducing POC root disease beyond that point than a seasonal gate would.

Calculating POC Resource Indicators

In all calculations, the following GIS layers were used: the road and route layer for each alternative, the stream layer, the POC layer and 2012 NAIP imagery. All values determined were done visually on a computer monitor, not by modeling or in an automated manner.

Indicator #1: High-risk routes and high-risk roads entering into uninfected POC were hand tallied by the number of times the road or route entered into uninfected stand. High-risk roads and routes crossing streams with uninfected POC stands growing less than 300 meters downstream were calculated by hand measuring, using a GIS measure tool, the distance to the nearest uninfected POC stand downstream of the crossing, from the point where the road or route intersected the channel.

This indicator was used to determine the risk of spreading POC root disease into non-infected stands of POC stands. Motor vehicle traffic directly accessing a POC stand increases risk of spreading the disease into that stand. Motor vehicle traffic indirectly accessing POC stands by crossing streams with POC within 300 meters downstream of the crossing is also high risk of introducing the disease into these stands. The latter is especially relevant to ultramafic soils because POC is often one of the few trees that grow within the stream channel. Port-Orford-cedar growing within a stream course often die within the first 5 years of a new infection. This would result in rapid canopy loss soon afterwards and a large pulse of dead trees falling into the stream channel as the snags rot and fall. This could lead to increase sedimentation during this period of decay and snag loss. It could also potentially result in loss of shade within the channel and subsequent increase of water temperature (Sinkiewicz and Jules 2003). Port-Orford-cedar are also a long-lived species that are highly rot resistant. Coarse woody debris derived from dead and down POC within the stream channel under normal processes provides a stable source of potential habitat for numerous aquatic and riparian species (Sinkiewicz and Jules 2003). Loss of POC within the channel could result, in the long term, to other smaller and less rot resistant tree species occupying the site, resulting in the loss of quality debris for habitat.

Indicator #2: Uninfected POC acres were calculated by using the *Identify* GIS tool to hand select potentially affected POC polygons adjacent to the road or route crossing and downstream of that location. Stands directly affected were estimated to be those stands immediately adjacent to route intersection and growing along the stream course. Stands indirectly affected were those growing upslope of the stream course, those stands with less risk of encountering PL inoculum. The management action was simply the proposed action to the UAR for the alternative, which would represent an indicator of relative risk to the base-line uninfested POC acres (current condition). Management actions include the following, from greatest risk to least risk: no action, gravel/road improvement, seasonal gate, permanent gate, physical barrier, decommissioned road impassable for motor vehicle travel.

Port-Orford-Cedar Methodology by Action

1. Direct and Indirect Effects of designating facilities (roads and motorized trails) to the NFTS, including necessary mitigations to protect water resources, seasons of use and vehicle class.

Short-term timeframe: <5 years.

Long-term timeframe: >5 years.

Spatial boundary: Smith River NRA and Gasquet Ranger District boundaries.

Indicators: Both indicators.

Unauthorized routes classified as *low risk* of introducing PL into POC stands would have the same short term and long term effects, whether designated to the NFTS or not. These routes would have a very low probability of infecting POC stands so they were not further analyzed. Designating UARs to the NFTS would allow greater control in regulating vehicle traffic, which helps reduce risks of PL infestation into POC stands. The effects of designating routes to the NFTS would vary greatly depending on the individual route and the watershed. Unauthorized routes were analyzed by alternative to determine the existing acres of a watershed currently infested and the potential increase based on POC acres put at risk (Table 3-84). Alternative 1, the No Action alternative, would ban cross-country motor vehicle travel. Even so, many high-risk UARs still access uninfected POC stands and other high-risk UARs access areas that are currently infested. A complete list of high-risk UARs, which includes those that access only infected stands and those that access uninfected stands, along with POC acres at risk is in the project file.

UAR 305.109, which was in the DEIS, was eliminated after field review determined there were no POC growing within the analysis distances. Additionally, UAR 305.118, which was originally not included in the DEIS, was included after receiving comments about this route. Field review determined small, but important, stands of POC growing within the route. There were other UARs that had been identified in comments received, but field review determined that POC was not growing within the analysis distances, or the routes were not being brought forward in any of the action alternatives.

Table 3-84. Potential acres effected by management action for all alternatives at the 7th-field watershed.[40]

7th-Field Watershed (Total Uninfested POC Acres)	UAR	Potential Acres Affected	Management Action by Alternative (POC Mitigations)		
			Alt 4	Alt 5	Alt 6
Lower Goose (370)	14N15.1	195	seasonal gate	barricade	year-round gate
	15N01A.4	185	year-round gate	barricade	year-round gate
Middle Goose (364)	14N15.1	166	seasonal gate	barricade	year-round gate
Upper Goose (215)	14N15.1	159	seasonal gate	barricade	year-round gate
Hardscrabble (189)	17N49.7	76	seasonal gate	barricade	seasonal gate
	17N49.12	13	seasonal gate	barricade	barricade
	17N49.11	7	seasonal gate	barricade	seasonal gate
	305.125	7	seasonal gate	barricade	seasonal gate
Upper Tribs Upper Middle Fork Smith (798)	18N02.3	95	seasonal gate/gravel	barricade	seasonal gate/gravel
Blackhawk – Yellowjacket (456)	15N01.102	46	seasonal gate	barricade	gravel
	15N36N.1	13	gravel	gravel	gravel
	15N36N.1B	3	gravel	barricade	gravel
Still (53)	305.118	36	seasonal gate	barricade	seasonal gate
West Fork Patricks Creek (79)	315.3	6	gravel	barricade	barricade
North Fork Diamond (14)	18N09.100	2	seasonal gate	barricade	seasonal gate
	18N09.108	2	seasonal gate	barricade	seasonal gate
Lower Tribs Lower North Fork Smith (190)	17N49.4	28	seasonal gate	barricade	seasonal gate
Lower Patrick (105)	316.12	17	gravel	barricade	gravel
	316.4	17	gravel	barricade	gravel
	316.8	1	gravel	barricade	gravel
Dead Horse – Eighteen Mile (396)	199.106	4	gravel	gravel	gravel
Copper (17)	305.121	2	seasonal gate	barricade	barricade
	305.123	2	gravel	barricade	barricade
	305.130	3	gravel	barricade	barricade

The No Action alternative had 115 UARs that were high-risk, totaling 65.10 miles and directly or indirectly accessed approximately 3546 acres of uninfected POC stands.

Of the 22 routes listed in the table above, Alternative 4 would have 1 UAR mitigated with a year-round gate (185 acres), 14 UARs that would be mitigated with seasonal gates (834 acres), 9 UARs with gravel (49 acres) and 93 UARs barricaded (2,478 acres); Alternative 5 would have no UARs that would be mitigated with gates, 2 UAR with gravel (17 acres) and the 113 barricaded (3,529 acres); and Alternative 6 would have 2 UARs that would be mitigated with year-round gates (705 acres), 8 UARs that would be mitigated with seasonal gates (253 acres), 7 UARs with gravel (84 acres) and 111 UARs barricaded (2,504 acres).

Direct and indirect effects were done on routes accessing currently uninfected stands since these routes pose the greatest risk. This is especially true of routes that access watersheds that are currently not infected. Routes that only pass through currently infected stands have minimal direct and indirect effects

[40] Alternative 1 has 115 high-risk UARs. This table reflects UARs that have POC mitigations where the action alternatives have at least one UAR that is not proposed to be barricaded.

on these stands since the disease is already established. These routes were analyzed in the cumulative effects section because they may contribute to additional effects (primarily by spreading the disease into uninfected stands) depending on the action alternative.

There would be a range of routes identified proposed to being designated to at least one of the action alternatives that access uninfected stands, from 58 routes (31.79 miles) for Alternative 4, 11 routes (7.52 miles) for Alternative 5, and 54 routes (26.50 miles) for Alternative 6. Regardless of the alternative, the short-term effect, if the disease did manage to get into the stand would be large. Infected smaller trees would show signs of the disease soon after infection, while larger trees could take several years to show signs of PL infection. Long-term effects would depend on the local conditions at the site of infection. Left untreated, the infestation could work its way into a stream course, rapidly work its way down stream, and kill almost all POC within the riparian zone within 5 years. Between 17 and 1,068 acres of POC could be put at some risk, depending on the action alternative. Within riparian zones, this could alter ecosystem dynamics along the stream course and immediately upslope of the riparian zone. Snag recruitment could increase dramatically, creating a larger pulse of course woody debris into the stream channel as these snags decayed and fell. In-channel bank instability could increase from the loss of stabilizing root mass from living trees, resulting in higher soil erosion rates. Water temperature could rise due to increased solar insolation. Port-Orford-cedar root disease allowed to spread could greatly increase the chances of infecting other streams within the watershed and introducing PL into nearby watersheds.

2. Direct and Indirect Effects to changes to NFTS, including Upgrading, Downgrading, Decommissioning, and designation of season of use on the existing NFTS.

Short-term timeframe: <5 years.

Long-term timeframe: >5 years.

Spatial boundary: Smith River NRA and Gasquet Ranger District boundaries.

Indicators: Both indicators.

Methodology and Assumptions: An identical methodology was used in determining POC risk to those current NFTS roads within all the action alternatives. It is assumed that changes to the existing NFTS will not have additional impacts to POC where the maintenance level has been downgraded to ML 1 or if the route is decommissioned. Only routes upgraded from an ML 1 may have an effect on POC. System Road 16N55 was determined to be low risk and removed from analysis.

The effects of upgrading or downgrading existing routes would vary depending on surface composition, stream-crossing conditions near POC stands and increased accessibility. Vehicle use in general has the potential to introduce PL infection, regardless of the vehicle class designation. However, in general, OHVs have an increased risk of introducing PL into POC ecosystems (USDA/USDI 2004). All routes classified as low risk of introducing PL into POC stands would have the same short term and long term effects, whether designated to the NFTS or not. These routes would have a very low probability of infecting POC stands. Downgrading the maintenance level of existing routes to ML 1 or decommissioning them would have the same effect in the long term, since these routes would be barricaded or otherwise closed to traffic, effectively greatly reducing the risk of infestation. In the short term, the efficacy of any chosen method for restricting vehicle access may vary, depending on the implementation timeframe and method of restricting access. Prior to implementation, all drivable roads designated to be ML 1 or to be decommissioned would continue to pose a risk. Method of motor vehicle access restriction also would pose various levels of risk. Gates or barricades are successful if they are not breached. Allowing vegetation to grow back on the road through non-maintenance would be effective at a future time when travel is not possible, but this could take years depending on the road surface, surrounding vegetation, available water and geology. Physically removing the road would be the best method of reducing risk. Changing from motorized use to non-motorized use would greatly reduce the risk of PL infection into POC stands. Foot and horse traffic would have the potential to introduce the disease, but the chances of doing so would be small. Upgrading vehicle class is associated with road improvements, which in general terms would reduce probability of infection, but it would be a small reduction. It would probably not reduce the high-risk rating of the route.

It is assumed that a vehicle driving in PL infected mud will pick up and accrue mud beneath the undercarriage and/or mud flaps of the vehicle. PL spores remain viable in infected moist mud for up to 6 months (Ostrofsky et al. 1977). All roads currently classified as ML 1 that fall into the high-risk category were considered low risk to POC after project implementation occurs despite their distance to POC or proximity to water. This is because motor vehicle traffic would not be allowed on them. However, upgrading ML 1 roads that fall within the high-risk analysis parameters would result in a change from the low-risk category to the high-risk category because motor vehicle traffic would be allowed on the road. Alternatives 5 and 6 both have no roads that would be upgraded from an ML 1. Alternative 4 has two roads (4.50 miles) that would be upgraded from ML 1 to a motorized-use status of ML 2 that would allow motor vehicle traffic. This would result in approximately 47 acres of uninfected POC stands that would be put at increased risk.

The current use of seasonal POC gate closures, defined by the season- of-use on system roads excludes vehicle use near POC stands during the wet months of the year. This applies to system roads and many UARs that are accessed beyond the gates. Seasonal gate closure success is dependent on the correct timing of the closure and the ability to restrict access beyond the gate. The gate location can increase the efficacy of restricting illegal vehicle access. The preferred locations for the placement of gates are in areas that severely restrict a vehicles ability to drive around them. This is usually on steeper slopes along narrow sections of the road that have steep road cuts, which make it difficult for vehicles to drive around. Placement of large boulders around gates can facilitate this. Relying on dense shrubs to block traffic is generally not very effective. Failure to limit vehicle use during the wet season on roads and routes near POC stands would have a potentially great impact. Short term effects of doing so would depend on the current risk factors associated with POC along a route, like those described in the *Risk Analysis Methodology* section. In general, it would increase the probability of spreading current infected mud into uninfected POC stands. The long-term effect would be the increased likelihood that PL is introduced into uninfected POC stands beyond the gate. There would be a higher probability of transporting infected mud from infected areas during unrestricted wet weather use. Wet weather use of roads that access uninfected POC stands would be the single greatest risk of introducing PL into POC stands.

3. Direct and Indirect Effects of restoration activities on UARs not brought forward in all action alternatives.

Short-term timeframe: <5 years.

Long-term timeframe: >5 years.

Spatial boundary: Smith River NRA and Gasquet Ranger District boundaries.

Indicators: All indicators.

All proposed action alternatives would include various restoration activities for those UARs listed in the alternatives that would not be included on the NFTS. Proposed activities include at least one of the following components and in some cases include a combination of the components: 1) waterbar or rolling dip, 2) remove culvert and associated fill, and/or 3) barricade. The first two restoration components are designed to directly improve hydrologic functions of the road and reduce erosion and offsite sediment delivery into water sources. The last component is designed to stop motor vehicle traffic and promote passive restoration of the roadway.

In addition to restoration activities, all action alternatives would prohibit motor vehicle use on these same UARs that would have restoration. Technically speaking, because of this, all high-risk routes proposed for restoration would in effect be considered low-risk to POC root disease. In practice, unintended use may occur. This would continue to put high-risk routes at risk until the project was fully implemented. Once fully implemented, all successfully barricaded routes would be considered low risk. High-risk routes not barricaded and relying on passive closure might still be at risk, depending on how long it would take before motor vehicle access was restricted.

Cumulative Effects

All high-risk NFTS roads that either had no change in the maintenance level or were not considered in the alternative were considered (Table 3-85). In addition, UARs proposed to be designated for each alternative that would access only infested stands were considered. The use of high-risk system roads, even when gated for seasonal use, inherently adds a component of risk, such as unexpected wet weather during the normal dry season of use or a low probability chance encounter of infested mud onto a vehicle’s undercarriage that results in transmitting the disease organism into uninfested stands. There are factors that cannot be controlled by seasonal gates.

Other Forest Service and non-Forest Service projects within the analysis area were reviewed that might have contributed or may contribute cumulative effect to the current project. Only those projects that had actions involving changing the risk of either further spreading PL or introducing PL into POC stands were further analyzed for cumulative effects to the current project. Most of the primary components of actions that would change risk are those that have the potential to directly or indirectly increase or decrease the amount of PL inoculum getting into POC stands, such as actions that directly manipulate

POC trees themselves, actions that may result in transporting infected soils either in or out of the project area, actions that may increase or decrease motor vehicle traffic into or out of nearby POC stands, and actions that may introduce PL into streams where uninfected POC grows immediately nearby or within 300 meters downstream.

Alternative 1 (No Action) cumulative effects were based on the current NFTS and UARs. Even though motor vehicle use on UARs would be prohibited for Alternative 1, there would continue to be risk to uninfected POC stands from unintentional and intentional illegal use. Because of this, all high-risk UARs were analyzed for potential cumulative effects. The same methodology was used to determine the number of times routes crossed into uninfected POC stands or passed across streams with uninfected POC stands growing less than 300 meters downstream of the crossing. Additionally, acres of currently uninfected POC that could potentially be affected by motor vehicle use on UARs were estimated within a HUC7 watershed for each high-risk route. Some routes passed into more than one HUC7 watershed containing non-infected POC. These were identified and discussed in the *Environmental Consequences* section, under Alternative 1.

Indicator(s): Both indicators were used.

Short-term timeframe: <20 years. Cumulative effects analysis will be done for the short-term timeframe for Alternative 1 only.

Long-term timeframe: 20 years.

Spatial boundary: Smith River NRA.

Methodology and Assumptions: The following factors were used to ascertain cumulative effects: 1) high-risk UARs accessing infected POC stands that are proposed to be designated to the NFTS; 2) POC plant associations within potentially affected watersheds; 3) current high-risk system roads with no proposed action accessing both infected and non-infected stands of POC; and (4) other projects within the analysis area that may lead to increased risk to POC.

Cumulative effects would be based on the risk of PL being introduced into a POC stand. If there were no introduction of POC root disease, then there would be no cumulative effects. The current management strategy requires season-of-use restrictions, in other words, seasonal POC closures in wet weather of system roads that access watersheds of concern. Long term cumulative effects related to use of NFTS roads and trails would be predicated on the effectiveness of this strategy, and effective seasonal POC gate closures accessing these routes would greatly reduce risks of PL infection, reducing the risk of long-term effects. If the disease got into POC stands, and its spread could not be stopped, then cumulative effects would depend on the existing conditions of the POC stands and their streamside location within the watershed.

Current NFTS routes have the potential to affect POC stands in a way as those proposed for designation (primarily the potential to spread the disease to currently uninfected stands and un-infected watersheds).These routes are currently being mitigated with seasonal closures (season-of-use designations). Those NFTS action roads proposed to be maintained or upgraded would have the same affects to POC as non-action system roads, notwithstanding POC mitigation measures. Unauthorized routes proposed to be designated to the NFTS system that passed through infected stands of POC were assigned a high-risk rating because of the risk of spreading the disease into non-infected stands. These routes were mitigated in various ways. Mitigation measures were designed to reduce the risk of spread of PL to uninfected stands. Most measures include improving road surface conditions designed to reduce the availability of infected mud that can be transported on vehicles. Typically, this would be done either by improving drainage by replacing undersized or damaged culverts on existing roads, installing culverts on newly designated routes, adding crushed rock and gravel or a combination of these.

County roads within the Smith River NRA are beyond the administration of the Forest Service. Many of these roads access NFTS roads that are within areas of heavy PL infestation. Seasonal restrictions on these roads would provide no protective measures in the short term since POC stands are already infected. They might prevent reinfection in the long term, but that would depend greatly on local conditions, especially in areas with heavy infestation. Installation of seasonal gates in these areas might reduce infected mud from being moved beyond the infection site, but nearby infected county access roads negate the benefits. Reducing the risk of vehicles becoming vectors for these roads was mitigated by improving the road surface conditions and drainage patterns, which reduces infected mud from accumulating on roads by reducing the chances of it sticking to the vehicle undercarriage and transporting the disease outside the area.

There were comments regarding 19N01 and its risk to POC. This system road passes through private lands in the upper reaches of Patrick Creek where more POC grows nearer to the road. Further south, the road crosses into national forest jurisdiction where it is located primarily on the ridge top and has low amounts of POC growing there. It then switches back down off the ridge into private land again. High-risk portions of this route were outside national forest lands, and those portions within national forest jurisdiction were considered low because of its ridgetop position.

All high-risk UARs that are not designated to the system will inherently continue to have risk unless motor vehicle traffic is restricted on them. Even though there would be a ban on cross-country travel on routes not designated to the system, continued illegal use of these routes would put uninfected stands of POC at risk that are in proximity to these routes.

A list of other projects that might have cumulative effects for potential impacts to POC that have occurred in the recent past, those that are presently occurring, and those occurring in the foreseeable future include:

- **Past Projects:** The current travel management project is being used to mitigate two land acquisition projects (Hurdygurdy and Goose Creek) to reduce the risk POC root disease. Another four projects were specifically designed to reduce the risk of PL spread (Roadside Sanitation of 15N39, the relocation of the Doe Flat and Youngs Valley trailheads and the North Fork Smith SIA, which included an installment of an additional gate on 18N13 to prevent trespass traffic). The Coast to Crest Trail construction, which went through portions of POC stands, consisted of handwork and low-risk construction activities that occurred during the dry months. The *Hardscrabble Bridge Replacement* project followed standard SRNF BMPs.

- **On-going Projects:** The *Hurdygurdy Recreation Improvement* project is mostly complete, but the installation of vaulted toilets is ongoing. Big Flat Campground, a component of the Hurdygurdy project, is currently infested with PL. Improvements within the area should reduce the risk of further spreading infected mud from the area in the long term. Another project within the Big Flat area is the *Thinning and Fuels Reduction* project, which treats vegetation within some areas containing POC. However, project implementation occurs during summer months when conditions are dry. In addition, POC mitigation BMPs are included in the project to minimize the spread of the root disease. Three fuel break projects (Station 3, Gasquet Community Wildfire Protection and Elk Camp) include treating fuelbreaks that may contain POC within the area. Implementation is done during the dry period, and fuels are hand treated. These are low risk activities of spreading POC root disease. Finally, two bridge replacement projects (Hurdygurdy and Steven's Memorial) include work that has POC BMPs included. Both projects included consultation with the forest POC coordinator prior to starting. The primary concern was to minimize the transport of infected soils onto non-infected areas. Seasonal restrictions apply to all of these activities.

- **Planned Projects:** Four planned projects are known that would have the potential to increase risk of PL spread: *Hurdygurdy Land Acquisition*, *Gordon Hill Vegetation*, *Griffin Creek Bridge* and *Aquatic Riparian Restoration*. Upon completion of the final Hurdygurdy land acquisition, the current travel management project may include some of these routes in the final decision. However, site-specific NEPA would be required to change any routes or roads not included in this document, which would include mitigations to reduce potential risk associated with changing any route status. The *Gordon Hill Vegetation* project has POC specific mitigation designed to reduce risk of PL spread. Prior to working on the *Griffin Creek Bridge* project, the forest POC coordinator would be contacted. Most bridge projects on the Smith River NRA require that infested not be moved to uninfested sites, which would apply to this project. The *Aquatic Riparian Restoration* project would have mitigations in place to ensure low risk to POC stands during the implementation phase.

  The 2015 Gasquet Fire Complex resulted in activity in and around NFTS roads. Several fires occurred within the analysis area, primarily all of the Coon Fire and portions of the Feeder and Bear fires. The Peak Fire occurred outside the analysis area. Suppression activity resulted in water drops on the fires from streams and lakes and spraying roads with water for dust abatement. Consultation with the forest POC coordinator occurred soon after the fires started. Maps were provided that identified all infested water sources as to provide areas to avoid using water that might transport infested water into POC stands during suppression activities. Road surface conditions were otherwise very dry and low risk for spreading the disease.

- **Non-Forest Service Projects:** There were three timber harvest plans within the California State Route 197 corridor adjacent to the forest. These projects are west of the forest boundary. All activities associated with these projects would occur off Forest Service lands. An incidental increase in motor vehicle traffic may occur within the Forest Service boundary, but any effects would be speculative. There are also five seismic bridge retrofits, three storm damage repairs and a STAA projects, all within the US Highway 199 corridor. Consultation with the forest POC coordinator would occur prior to implementation for POC mitigation measures, which typically are designed to minimize the transport of infected soils to non-infected sites.

- **Miscellaneous Projects:** Special forest products collection has a slight risk in spreading PL into non-infected stands, especially POC bough collection. Access into POC stands for bough collection is limited to foot traffic, which is low risk. Even so, use of NFTS roads to travel to POC stands can pose a higher risk. There is no seasonal designation for collection permits. However, seasonal POC gate closures would apply to all motor vehicle traffic, including bough collectors.
- **County Roads:** County roads pass through and access much of the Smith River NRA. Almost all are non-paved. Most of these roads currently pass through infested stands of POC, and the disease is probably still present in the soil in various locations even though the areas have been infested for many years. County Road 427, along the South Fork Smith River, is the one major paved county road in the project area. Because it is paved, it has a low risk of transmitting diseased soil to motorized vehicles during wet periods of the year. Other county roads, primarily 305 (Low Divide), 314 (Gasquet Toll), 315 (Holiday), 316 (Patricks Creek), 405 (Gordon Mountain) and 411 (French Hill) are all non-paved, and many are composed of native surface material. Most stands of POC adjacent to these road systems are infested or became infested in the past, and the disease is probably present in the soil. The forest does not have jurisdiction on these roads. Many NFTS roads that branch off from these county roads have infested POC stands along them. Most NFTS roads containing non-infested POC that branch off from county roads have been mitigated with seasonal gate closures. Many of the NFTS roads that branch off from county roads that have infested stands of POC would be mitigated with improving the surface conditions. The primary reason for doing this instead of putting season gates on them is due to the persistent inoculum pressure that exists along the county roads that have areas with of infested POC, which acts as a source for infested soil movement.

Climate change is unknown how it may affect the spread of PL. Cumulative effects based on climate change are speculative. The greatest effect would be increased rainfall or rainfall occurring during the time of year when seasonal gates would be generally open. Timely closure of gates is critical in maintaining adequate mitigation in areas where these restrictions are in place.

Table 3-85. Existing high-risk NFTS roads, infection status acres by 7th-field watershed and acres at risk.

7th-Field Watershed (Uninfected Acres)	NFTS Road	Current Infected Acres	Acres at Risk	7th-Field Watershed (Uninfected Acres)	NFTS Road	Current Infected Acres	Acres at Risk
Lower Goose (370)	15N13 14N15	0	166	Monkey (259)	18N17	163	83
Middle Goose (364)	15N13 14N15	0	153		18N17B	163	4
Upper Goose (215)	15N13 14N15	0	32		18N17C	163	7
Upper Jones (497)	16N02L	47	168		18N17D	163	18
Quartz (458)	16N18A 15N42	0	174		18N17E	163	110
Lower Rock (125)	16N23	48	51		18N17F	163	40
Upper Hurdygurdy (302)	17N04L	38	41	East Fork Patrick (66)	18N26	43	27
	16N32	38	21	Lower Patrick (106)	18N16	21	17
	16N33	38	28	Canthook – Rattlesnake (181)	15N02	52	7
Lower Siskiyou Fork Smith (118)	17N32	145	102	Middle Turwer (8)	14N01D	0	3
Little Jones (191)	17N36	0	94	Upper Jones (497)	16N03K	48	2
Upper Tribs Upper Middle Fork Smith (798)	18N02	95	110	Knopti (195)	18N11	138	6
Blackhawk - Yellowjacket (456)	15N38	101	6	Lower Craigs (86)	17N40	211	11
Boulder – Deer (162)	16N16	246	17	Middle Hurdy Gurdy (172)	16N03D	60	2
Coon – South Fork Smith (184)	16N19	250	17	Buck (738)	14N38	0	143

Affected Environment

Port-Orford-cedar (*Cupressus lawsoniana* [A. Murr.] Parl.) is the largest species of its genus and the largest representative of the family *Cupressaceae* in North America. Port-Orford-cedar is found from southwestern Oregon to northwestern California, primarily in the Coast Ranges and Siskiyou and Klamath Mountains, with a small disjunct population in the Scott Mountains of California.

Although POC has a narrow geographic range, it has a wide ecological amplitude (that is, it occurs over a wide range of environments). The species is found at elevations from sea level to 6,400 feet, in glacial basins, along streams, on terraces, and on mountain side-slopes from lower to upper one-third slope positions. Port-Orford-cedar shows adaptability to a wide range of summer humidity, from very high humidities along the coast to very low summer humidities inland. Port-Orford-cedar can be found among a variety of species with differing ecological requirements (Jimerson and Creasy 1997), from coast redwood (*Sequoia sempervirens*) to higher elevation mountain hemlock (*Tsuga mertensiana*).

There is a suite of endemic and uncommon plants that can grow, some thriving, on ultramafic soils (Whittaker 1954). Port-Orford-cedar is associated with rare plants of ultramafic systems. Because it is often one of the few, or only tree species that can tolerate these sites, POC probably has a key role in maintaining the function of ultramafic systems through shading and stabilizing soils. Port-Orford-cedar recycles calcium on these sites, making it more available to other species (USDA 1982). By recycling calcium onto the surface soil, POC may help improve soil fertility, an important quality in harsh ultramafic environments (Ullian and Jules 2000).

Life History

Port-Orford-cedar trees are very long lived. Jimerson and Daniel (1994) found an average stand age of 352 years on study plots, with most trees in the 326- to 425-year age group. Disturbance (other than from PL) is from infrequent flood and fire events. The low frequency of fires is due to POC usually occurring in or near continually wet environments.

Some POC trees start to bear cones within 8 years under natural conditions and earlier in greenhouse conditions. Cone bearing becomes general by 20 years, is best at about 100 years, and continues for the life of the tree. Seed crops are frequent; heavy crops are produced every 4 to 5 years and some seed is usually produced every year.

Most seed germinates soon after falling. Seedfall begins in September, reaches a maximum in winter, and continues through spring (USDA 1965). Natural reproduction is successful if there is a bare, mineral soil seedbed and sufficient moisture. Port-Orford-cedar survives well in plantations if animal browsing and competition from other vegetation is avoided (USDA 1965).

In the most abundant portion of the range, POC is common in mixed stands up to 20 to 25 years old, after which it is usually overtopped and grows slowly. Once established, the species is relatively shade tolerant and long lived. It retains to an old age the capacity to respond if released from surrounding Douglas-fir and other overstory trees. Port-Orford-cedar is capable of moderately rapid growth when not overtopped by other trees. Mature trees can reach 4 to 5 feet in diameter and 200 feet tall. Mature trees are generally older than 200 years (USDA 1965). Port-Orford-cedar is subject to windthrow. It has no taproot, and the numerous lateral roots are usually of a small diameter. The tree has a tendency to grow multiple stems at any height (USDA 1965).

Phytophthora lateralis (PL)

Port-Orford-cedar is affected by an exotic root pathogen, *Phytophthora lateralis* (PL), which was first documented in a nursery near Seattle, Washington, in 1923. Nearly always fatal to the trees it infects, research shows the spread of the pathogen is linked, at least in part, to transport of spore-infected soil by human and other vectors.

Infected trees were first identified in California in 1980. The pathogen now infests about 9 to 15 percent of the federally administered POC acreage within the range. The forest has the greatest extent of POC on federal and State lands in California. Forest Service inventories on the SRNF reveal PL infection has spread across an estimated 3,300 acres within the Smith River NRA analysis area (13,535 acres) containing POC. Port-Orford-cedar is spread over the northern portion of the forest and decreases in extent toward the south. The Smith River NRA/Gasquet Ranger District has about 67 percent of the POC on the forest. The southernmost POC in the natural range is on the Lower Trinity Ranger District.

Although POC occurs in a wide range of environments, the highest risk of infection is associated with wetlands and riparian reserves with most of the infected areas occurring along streams and roads. Of the

POC on the forest, about 77 percent is found in riparian landscapes. This is in part because PL does not readily move above roads or upslope from streams unless carried by some vector.

The pathogen virtually requires standing water to infect trees. *Phytophthora lateralis* moves through water easily; on dry sites or in dry conditions its spores lay dormant. The zone of highest risk is restricted to a narrow strip along streams affected by water level in the soil profile. Port-Orford-cedar even a few feet away from water or seasonally saturated soils is at little risk regardless of the management strategy imposed.

Port-Orford-cedar growing in upland situations usually escapes infection even when the pathogen is established in nearby drainages or wetlands, unless there is root-to-root contact between the POC stands. In some cases, however, upland sites, when they are in lower or concave slope positions that collect water, can also be considered high risk.

Other than Pacific yew growing with POC, the pathogen affects only POC and does not have an alternate or hidden host, nor does it travel through the air. *Phytophthora lateralis* has very low levels of genetic variation, and so is not likely to adapt to different species or even to resistant POC.

Type of carrier

Vehicles (both motorized and non-motorized), equipment, humans on foot, and animals (especially cows, horses, and elk) have been implicated in carrying PL. The probability of successful spread is greater with the larger carriers, those that transport greater amounts of soil, those most likely to access infected areas, and those that can rapidly travel to new sites. Today, the NFTS includes 115 designated route segments (totaling 65.10 miles) and 139 system road segments open to public use on the MVUM. At the forefront, the premise for the high-risk rating is the likelihood PL spores will be transported on vehicles driving from infected areas on roads and trails that go through or near uninfected POC forest stands.

Time of year of transport event

The likelihood of acquiring inoculum, successfully transporting it, and establishing disease at a new site is greatly favored by cool temperatures, and probability of infection is much greater during wet periods than dry ones. In addition, inoculum is most likely to be picked up from an infected site during wet period when infected soil is muddy and prone to adhere to the carrier. Probability of spread and establishment of new infections is greater with soil movement in late fall, winter, and early spring than summer, and is greater in rainy rather than dry weather. Probability of successful delivery of viable inoculum from one site to another decreases with distance traveled and associated time elapsed since inoculum was picked up.

Port-Orford-Cedar Road and Trail Closures

Starting in the late 1980s and early 1990s, the Smith River NRA began identifying vehicle access points that increased the risk of spread into uninfected POC stands and began implementing a variety of road closure types. These consisted of permanent barriers, such as earthen berms and rock barricades, and gates, both seasonal and permanent. In addition, several roads that had accessed POC stands have been decommissioned over this time and are no longer part of the NFTS. Several trailhead access points have been re-routed to minimize the spread of PL, such as the parking access to Devils Punchbowl and Island Lake.

Efficacy of closure types has been mixed. Six gates that were initially installed for POC protection currently have infested POC stands beyond the gate. Five are seasonal and one permanent. However, 16 current road-closure locations still provide successful protection of POC almost 30 years after installation, and no stands beyond these locations are currently infested. Eleven of these are seasonal gates and five are permanent, three of which are dirt barriers.

Successful closures depend largely on the location. Placing gates or other barriers in areas of steep topography and dense surrounding vegetation severely reduces the probability of vehicles getting beyond that point. Some gates or berms that were installed on more gentle terrain had been successfully breached. Over the years, gates have been moved to prevent this from occurring. Seasonal gate closure is also dependent on timely implementation before seasonal rains increase the risk of PL spread.

The forest receives dedicated funding specifically for POC resource protection, which includes POC gate monitoring and maintenance. The forest monitors closures to see if they are still functional, and they are repaired or replaced, when necessary. The forest also reconsiders previous closures to determine if conditions are still valid to restrict access. In 2001, the Forest Service authorized the prohibition of motor vehicle access in the High Plateau to avoid the introduction of PL into uninfected POC plant communities within the North Fork Smith River Special Interest Area (USDA 2001 Decision Notice for the North Fork Smith River Special Interest Area Road Access). This decision was re-affirmed in 2013 after determining that the disease was not present within this area.

Environmental Consequences

See the *Effects Methodology* section above regarding how this analysis was conducted.

Effects common to all alternatives

Cumulative Effects

Cumulative effects common to all alternatives are the presence of high-risk NFTS roads. Even though these roads will have seasonal closures implemented for all alternatives, there would inherently be a risk to uninfected POC stands due to unauthorized access during the closure period. Additionally, during periods of allowable use, there may be localized moisture and conditions that could involve spreading PL into uninfected stands. These include the roads listed in Table 3-85 above.

The following six 7^{th}-field watersheds are currently not infected: Upper Goose, Middle Goose and Lower Goose Creeks, Middle Turwer Creek, Buck Creek and Quartz Creek.

System Roads 14N15 and 15N13 have the greatest potential impact to the 6^{th}-field Goose Creek watershed. Within this larger watershed, it accesses the Upper Goose Creek watershed, which is currently uninfected. Upper Goose Creek flows to Middle Goose Creek and Lower Goose Creek. Introduction of PL along either road into the watershed would put 15 percent of the Upper Goose, 42 percent of the Middle Goose and 45 percent of the Lower Goose Creek watersheds at increased risk.

System Roads 14N01D, accesses the Middle Turwer Creek watershed, 14N38 accesses the Buck Creek watershed, and 16N18A and 15N42 both access the Quartz Creek watershed, which are all currently uninfected watersheds. Introduction of the disease within these watersheds would put 37 percent, 19 percent and 37 percent of the respective watersheds at risk.

System Road 17N36 accesses Little Jones Creek, which is currently uninfected. Introduction of PL here would put 49 percent of the POC within the watershed at risk. Route 16N02L, at the headwaters of Little Jones Creek, which is almost 9 percent infected, would increase the risk to 40 percent in this watershed.

In addition, the following roads access infected watersheds but would have a potentially large impact to increasing the percentage of the infestation within the watershed.

16N23 accesses POC within Lower Rock Creek, which is currently 28 percent infected, but introduction of PL along this road would put an additional 29 percent of the POC within the watershed at risk. 18N17 accesses the Monkey Creek watershed, which is currently 39 percent infected. This route has the potential to infect an additional 26 percent POC within this watershed. Two additional spur roads off the 18N17 system, 18N17E and 18N17F access another 26 percent and 9 percent, respectively.

Access through 17N32, within the Lower Siskiyou Fork Smith River, which is currently 53 percent infected, would increase the risk to 94 percent. Combined access to the Upper Hurdy Creek watershed, which is currently 11 percent infected, through 17N04L, 16N32 and 16N33 would increase the risk of PL infestation by 12 percent, 6 percent and 8 percent respectively, but collectively would be an additional 19 percent for the watershed.

There would be increased risk to the Lower Patrick Creek watershed, from 16 percent to 30 percent with road 18N16. The East Fork Patricks Creek, which is 39 percent infected now, is accessed by System Road 18N26. This puts an additional 25 percent of the watershed at risk.

The following roads would potentially have a slight increase to currently infected watersheds.

A minor risk of increase PL infestation (5 percent or less) would occur with System Roads 17N40 in Craigs Creek watershed, which is currently 71 percent infected and 16N03D in the Middle Hurdy Gurdy Creek watershed, which is currently 26 percent infected. System Road 15N38, within the Blackhawk-Yellowjacket watershed, which is currently 18 percent infected, would slightly increase the risk by about 1 percent.

A small segment of 18N02, on the upper tributaries of the Upper Middle Fork Smith River, currently 11 percent infected, which accesses UAR 18N02.3, would have the potential to infest the same area that 18N02.3 accesses, an additional 12 percent. Unauthorized route 18N02.3 was discussed in the direct and indirect effects section, due to their close proximity to each other. Cumulatively, the amount of area potentially infected would not increase, but the probability of infestation may increase because of increased traffic on 18N02.

The following roads would increase the risk within their respective watersheds less than 5 percent. 18N17B, 18N17C, and 18N17D, all within Monkey Creek, would increase risk to POC by 1 percent, 2 percent and 4 percent, respectively. 16N19 within Coon Creek-South Fork Smith River increases risk by 4 percent, 15N02 within Lower Rock Creek, by 3 percent, 16N03K within Upper Jones Creek, less than 1 percent and 18N11 within Knopti Creek, 2 percent. Collectively these roads access around 61 additional acres of POC.

All high-risk roads discussed above would have seasonal restrictions. Timely closure of gates and successfully restricting traffic beyond the gates during closure periods would minimize the risks of spreading PL and any cumulative effects described above associated with disease into the respective drainages.

As stated before, the biggest cumulative impact would be increased risk to watersheds currently not infected. The following roads access watersheds that are currently not infestation: 15N13 and 14N15 (Upper, Middle and Lower Goose Creek), 16N18A and 15N42 (Quartz Creek), 14N01D (Middle Turwer Creek) and 17N36 and 16N02L (Little Jones Creek).

Alternative 1 – No Action

This alternative would not designate routes to the NFTS. There would be no changes to the existing NFTS, including upgrading, downgrading, decommissioning, and there would be no new changes to current season of use restrictions.

Indicators: Both indicators were used.

Routes designated to the existing NFTS: No routes would be designated to NFTS.

Changes to NFTS: There would be no changes to the NFTS.

Seasonal closure: Existing season-of-use designations (i.e. seasonal closures) would remain in effect, and no new seasonal closures would be implemented.

Direct and Indirect Effects to designation of new facilities (roads, motorized trails) to the NFTS.

No UARs would be designated to the NFTS so there would be no direct or indirect effects. Indirect effects would include unauthorized use of non-barricaded high-risk UARs that access non-infected POC stands. Even though cross-country travel along UARs would be prohibited, unauthorized use would still likely occur. There were 53 high-risk unbarricaded UARs (43.11 miles) that access uninfected POC at least 83 times by stream crossings or direct stand access, and there are 17 high-risk unbarricaded UARs (10.73 miles) that access a mixture of infected and uninfected POC stands at least 33 times by stream crossings or direct POC access. Approximately 555 acres within one stream network, crossing two separate HUC-7 watersheds, is the greatest number of POC acres put at risk from any one UAR. Eight HUC-7 watersheds that are currently disease free would be indirectly put at risk. All un-barricaded high-risk UARs collectively put approximately 3,546 acres of POC at risk.

Direct and Indirect Effects to changes to the NFTS including upgrading, downgrading, decommissioning, and designating season of use on the existing NFTS.

No changes to the current NFTS are proposed so there would be no direct or indirect effects. Season of use would remain unchanged so there would be no direct and indirect effects.

Cumulative Effects

High-risk UARs accessing infected stands of POC pose an increased risk of spreading the disease from infected to uninfected POC stands. There are 47 UARs (11.26 miles) that access only infected POC stands at least 41 times by either stream crossings or direct stand access. Even though there would be no new changes to the NFTS system, either through designation of UARs or changing the maintenance level to roads, high-risk would continue to exist through the continued use of the existing road network and any unintentional or illegal use of UARs. Existing seasonal closure would remain in effect for system roads. An analysis of the existing NFTS roads and surveyed UARs in the project area determined that there are approximately 303 miles of NFTS roads and 65 miles of UARs that are currently rated as high risk. The following are the ML ratings for the roads, along with their corresponding miles. Maintenance Level 1 roads total 38.6 miles. Operational maintenance level 2 roads total 116.11 miles; ML 3 roads total 116.49 miles; ML 4 roads total 9.84 miles; and ML 5 roads total 18.55 miles.

The greatest risk to uninfected POC stands (and an indicator of risk) is the number of times high-risk roads and routes directly cross into stands or drive across streams and wet areas that access uninfected POC stands within 300 meters below the crossing. High-risk ML 1 roads are currently closed to the public, which should reduce the risk rating to Low; however, some closures are implemented using permanent gates, and the efficacy of these gates depends on the ability to successfully restrict traffic. Evidence exist that show successful attempts at circumventing these gates, which therefore increases the risks of introducing PL into POC stands and watersheds that are currently uninfected. Other ML 1 high-risk roads are effectively closed due to the road conditions that render them impassable to motor vehicles. Even though these roads have been rated high-risk, they currently have a low risk of spreading POC root disease. The current management strategy for ML 2 and greater system roads accessing watersheds of concern requires seasonal POC closures in wet weather. Without seasonal gates, high-risk system roads directly or indirectly access uninfected POC stands approximately 230 times. Depending on the road, up to 800 acres within a single stream network (two HUC-7 watersheds) of uninfected POC would be put at increased risk. High-risk UARs accessed uninfected stands approximately 116 times, cumulatively putting a little over 1500 acres of POC at increased risk. Long term cumulative effects related to use of authorized roads and motorized trails would be predicated on the effectiveness of this strategy, and effective seasonal POC gate closures for these routes would greatly reduce risks of PL infection. The potential effects of this alternative to POC would depend on the risk of increased PL spread into the watersheds. Illegal use of high-risk UARs not designated to the system would continue to put uninfected stands of POC at risk.

Alternative 4

This alternative proposes designating 58 high-risk UARs (including motorized vehicle trails) to the NFTS, and changing vehicle class to 30 existing high-risk roads, which includes decommissioning 20 roads and converting one road to a motorized trail. It also proposes to maintain four ML 1 high-risk roads, 44 ML 2 high-risk roads, and three ML 3 high-risk roads. Actions analyzed in this alternative are summarized below.

Indicators: Both indicators were used.

Routes designated to the existing NFTS: Approximately 32 miles of high-risk routes would be designated to the NFTS.

Changes to NFTS: Approximately 32 miles of existing NFTS motorized routes would be changed to a new motorized designation (16.89 miles downgraded, 4.50 miles upgraded and 17.51 miles decommissioned).

Season closure: Seasonal restrictions would prohibit motorized use of NFTS routes (42 miles) during periods of wet weather in the project area.

Direct and Indirect Effects to designation of new facilities (roads, trails) to the NFTS.
Fifty-eight high-risk routes (31.61 miles) would be designated under this alternative. One (1.20 miles) would be designated as ML 1, 14 (10.53 miles) would be designated as ML 2, three (0.39 miles) as ML 3 and 40 (19.49 miles) as motorized trails. Only those high-risk UARs designated that access currently non-infected stands were analyzed for direct and indirect effects. Twenty-two designated UARs would access uninfected POC stands directly or indirectly via stream crossings at least 33 times, and 7 designated UARs would access a mixture of infected and uninfected stands nine times. Proposed high-risk UARs accessing currently infected stands were analyzed for cumulative effects.

Direct effects to designating high-risk UARs to the NFTS would be improved motorized access to 1068 acres of uninfected POC. This would increase the risk of infestation to the stands accessed by these routes.

Route 14N15.1 has the greatest potential impact, directly accessing 280 acres of POC within the riparian corridor of Upper, Middle and Lower Goose Creeks downstream and, indirectly affecting an additional 240 acres adjacent to streamside positions within these three watersheds. It is proposed to be designated as an ML 2. Currently these watersheds are uninfected. Infection within the Upper, Middle and Lower Goose Creek watersheds would potentially result in 61 percent, 38 percent and 45 percent of the watersheds, respectively, becoming infected, resulting in an overall infection of 40 percent of the Six Order Goose Creek watershed, which is currently uninfected. Access to 14N15.1 is via 14N01, which currently has a seasonal gate. Route 15N01A.4 directly accesses 130 acres within the riparian corridor of Lower Goose Creek and, indirectly an additional 55 acres adjacent to the streamside positions. It is proposed to be designated as an ML 2 and a year-round gate is proposed.

Another watershed that is currently uninfected is Still Creek. The high-risk UAR 305.118 directly accesses about 2 acre of POC but indirectly affects another 34 acres, which would put roughly 5 percent of the POC in this watershed at risk. A seasonal gate is proposed.

Route 17N85 accesses the Little Jones Creek watershed and put 31 acres of POC at increased risk. This watershed is currently uninfected. Should the disease be established within this drainage, it would put 16 percent of the POC at risk. However, this route is proposed to be designated as ML 1 and barricaded, and once fully implemented would be low-risk for speeding PL.

Route 17N49.7 within the Hardscrabble Creek watershed accesses about 60 acres of uninfected POC. Introduction of the disease within these stands would increase the infected POC within this watershed from 27 percent to 51 percent. Additionally, most of the POC plant communities associated with this route are associated with serpentine derived soils. Port-Orford-cedar growing in serpentine soils often is found in streamside positions or immediately upslope of streams. One plant community in particular, Port-Orford-cedar/western white pine/*Ledum glandulosum*/*Darlingtonia californica*, grows in boggy, wet conditions, and it is often associated with rare and Sensitive plant species. There are about 600 acres of this plant community growing on the Smith River NRA, of which 17 percent is currently infected with PL. This route crosses several creeks with this plant community present, approximately 12 acres.

Additionally, 17N49.11, 17N49.12 and 305.125 access other POC stands within this watershed. Collectively they have the potential of infecting an additional 31 percent in the Hardscrabble Creek watershed. Seasonal gates are proposed for all of these routes.

Route 17N49.4 accesses approximately 14 acres of uninfected POC in the Lower Tributaries of the Lower North Fork Smith River, which is currently 7 percent infected. This route increases the risk an additional 7 percent within the watershed. A seasonal gate is proposed for this route.

Route 15N01.102, within the Blackhawk-Yellowjacket watershed accesses POC stands, which if became infected, would increase infestation within this watershed from 18 percent to 25 percent. Routes 15N36N.1 and 15N36N.1B are within the Blackhawk-Yellowjacket watershed. These two routes access collectively about another 2 percent of POC within this watershed. Combined with 15N01.102, an additional 8 percent of the watershed would be at an increased risk of becoming infected. A seasonal gate is proposed for 15N01.102 on the right spur that accesses most of the POC on this route. The other two routes are proposed to be graveled to minimize infested mud transport into nearby POC stands.

Route 18N02.3 is a small spur on the Upper Tributaries of the Middle Fork Smith watershed. This watershed is currently only 4 percent infected, but this route’s location is near the headwaters and could potentially infect an additional 95 acres or 12 percent. One plant community potentially affected would be the POC/*Abies magnifica-Quercus sadleriana/Vaccinium membranaseum* plant association. Only 117 acres of this type grow on the district, and this route accesses 35 acres or 35 percent of that plant association. Currently there is a known infection site near Sanger Lake, less than a half mile away. Access to this route is via 18N07, which currently has a seasonal gate.

Route 199.106 crosses Eighteen Mile Creek via a bridge just before it flows into the Middle Fork Smith River. There is about 1 acre of POC downstream of the bridge crossing. This route is also well surfaced, which greatly reduces risk for this route.

Routes 18N09.100 and 18N09.108 access the North Fork Diamond Creek watershed, which is currently highly infected. Only 60 acres of POC have been mapped within this watershed, but 46 acres are already infected. These two routes and they would increase risk another 4 acres, from 77 percent to 79 percent. Access to these two routes is via 18N09, which currently has a seasonal gate.

The West Fork Patrick Creek watershed is currently 19 percent infected, and high-risk UAR 315.3 would increase access and risk of infecting another 6 acres, or 5 percent of the POC within this watershed. Routes 316.12 and 316.4 both access the same POC stand within the Lower Patrick Creek watershed. They put an additional 17 acres of POC at risk. Route 316.8 puts approximately 1 acre of POC at risk within the same watershed. Combined, they increase POC risk another 10 percent to the watershed. All these routes are proposed to be graveled and all come off county road 316, which is heavily infested along several sections of this road.

Routes 305.121 and 305.123 put the same stand of POC at risk, roughly 1 acre within the Copper Creek watershed. Route 305.130 accesses around 3 acres of uninfected POC within Copper Creek. Taken together, these routes would increase risk from currently infected 47 percent to 53 percent. Much of the POC stands nearby are already infested and topography makes barricades and gates difficult to enforce.

All these routes are proposed to be graveled and all come off County Road 305, which is heavily infested along much of the road.

This alternative puts approximately 5.2 percent of POC on the district at a higher risk of infection due to direct and indirect access from UARs.

Direct and Indirect Effects to changes to NFTS and seasonal closures.

Thirty high-risk roads (39.95 miles) are proposed to change the maintenance level. Six (6.50 miles) are proposed to by downgraded to ML 1, two (4.5 miles) upgraded to ML 2, one (1.00 miles) to a motorized trail, and 20 (17.51 miles) decommissioned.

Nineteen high-risk routes (42.07 miles) are proposed to be restricted seasonally with POC gate closures. Eleven existing NFTS roads (31.36 miles) would have seasonal gate closures, and eight UARs (10.71 miles) that are proposed to be designated would have seasonal gate closures.

High-risk routes downgraded to ML 1 and decommissioned would result in a low-risk rating and are not further analyzed. Upgrading a high-risk route from ML 2 to ML 3 would reduce the risk of the route, but it would probably be a very small reduction.

Seasonal gate closures, to reinforce season-of-use restrictions, would reduce the risk of introducing PL beyond the gate location. Gate closures are only as good as the timing of enforcement and the ability to prevent vehicle traffic from circumventing the gate. A gate's location is very important in minimizing a breach in the closure. It should be located in an area where vehicles cannot easily drive around the gate, preferably on a steeper slope.

Cumulative Effects

There were 80 high-risk roads (145.24 miles) that either had no proposed changes or that were not included in this alternative. Thirty-three (46.80 miles) access POC stands that are completely uninfected, 20 (72.60 miles) accessed portions of uninfected POC stands, and. 27 (26.83 miles) accessed POC stands that are currently infected. All designated high-risk UARs accessing infested stands would be mitigated by improving the surface conditions, primarily with graveling the surface. A few routes would be designated as ML 1. These would not have mitigations because of this status, but most would be barricaded. All but four of the high-risk UARs that are proposed for restoration would have barricades associated with them to restrict unauthorized motor vehicle access. Of the remaining four, three would have permanent gate closures associated with the roads that access the UARs, and the fourth would be accessed from an existing non-motorized trail network. All others would have physical barriers proposed either on the route itself or restricted from the parent road being proposed for decommissioning. High-risk UARs designated as ML 1 were treated in this analysis as Low Risk. Existing high-risk roads being proposed for decommissioning were treated likewise. There would be 48 current high-risk ML 2 roads kept in this maintenance status but with improvements. Twenty-three (23.25 miles) pass through only infected POC stands, 14 (56.20 miles) pass through a mixture of infected and uninfected stands, and 11 (19.11 miles) pass through uninfected stands. Improvements typically would involve brushing the road edges and increasing the drainage from road surfaces. Brushing would probably have little effect in either increasing or reducing risk. Improving road drainage, however, prevents water from pooling, which could reduce PL spore densities that accumulate in standing water so this may reduce the risk of infecting nearby stands.

Climate change would have unknown effects on the spread of PL. Cumulative effects based on climate change are speculative. The greatest effect would be increased rainfall or rainfall occurring during the time of year when seasonal gates would be generally open. Timely closure of gates is critical in maintaining adequate mitigation in areas where these restrictions are in place. If rainfall seasonality patterns changed, gate closure dates would have to be re-evaluated and changed. Of all the action alternatives, Alternative 4 relies heaviest on seasonal gate closures rather than permanent closures to mitigate risks to POC. Given the seasonal gate closures rely on rainfall-based real-time management these gates carry a higher risk than permanent closures for allowing the spread of PL.

Alternative 5

This alternative proposes designating 11 high-risk UARs (including motorized vehicle trails) to the NFTS, changing maintenance level of 85 high-risk existing roads including decommissioning, designation of season-of-use. It also proposes to maintain four ML 1 high-risk roads, eight ML 2 high-risk roads, and four ML 3 high-risk roads. Actions analyzed in this alternative are summarized below.

Indicators: Both indicators were used.

Routes Designated to the Existing NFTS: Approximately 8 miles of high-risk routes would be designated to the NFTS.

Changes to the existing NFTS: Approximately 109 miles of existing high-risk NFTS motorized routes would be changed to a new motorized designation (49.24 miles downgraded and 59.32 miles decommissioned).

Season closure: Seasonal restrictions would prohibit motorized use of new NFTS routes (19 miles) during periods of wet weather in the project area.

Direct and Indirect Effects to designation of new facilities (roads, trails) to the NFTS.

Eleven high-risk routes (7.52 miles) would be designated under this alternative. Two (4.43 miles) would be designated as ML 1, four (1.34 miles) as ML 2, three (0.39 miles) as ML 3, and two (1.36 miles) as motorized trails. Three designated UARs would access uninfected POC stands directly or indirectly via stream crossings at least seven times. One designated UARs would access a mixture of infected and uninfected stands at least one time. This route was split into two sections, and the segment that accessed uninfested POC was proposed to be barricaded. Just like Alternative 4, only those high-risk UARs that access currently non-infected stands were analyzed, which resulted in two UARs that would have potential direct and indirect effects if designated to the NFTS and that would access approximately 17 acres of uninfected POC.

High-risk UAR 199.06 was already discussed in Alternative 4 and would have the same effect for this alternative, putting 4 acres of uninfected POC at risk within the Dead Horse-Eighteen Mile watershed. UAR 15N36N.1 was discussed too, but in conjunction with another route. In this alternative, only UAR

15N36N.1, within the Blackhawk-Yellowjacket watershed, would access about 13 acres, or 2 percent, of uninfected POC.

This alternative puts less than 0.1 percent of POC on the district at a higher risk of infection due to direct and indirect access from UARs.

Direct and indirect effects to changes to NFTS and seasonal closures.

Sixty-eight high-risk roads (110.27 miles) are proposed to change the maintenance level. Thirty (38.81 miles) are proposed to by downgraded to ML 1, two (12.14 miles) downgraded to an ML 2 and 36 (59.32 miles) decommissioned. Those actions that would result in changing maintenance level to ML 1 or decommissioned would reduce the risk to POC to low risk so no other analysis was done on these routes.

Two NFTS ML 3 roads, 17N07 (10.39 miles) and 17N49 (1.75 miles) would be downgraded to ML 2. This might increase the risk of these routes somewhat, but it probably would be negligible. 17N07 had roadwork done in 2015 that met ML 2 standards because it will be used for the Gordon Hill timber project, which was discussed in the *Methodology* section under *Cumulative Effects*.

Seven proposed high-risk routes (18.95 miles) would be restricted seasonally with POC gate closures. Six existing NFTS roads (18.66 miles) would continue to have seasonal gate closures, and one UAR (0.29 miles) proposed to be designated as a road would have seasonal gate closure.

Cumulative Effects

This alternative has the least potential cumulative effects due to PL infestation from system roads. All high-risk system roads contributing to cumulative effects under this alternative have been discussed in previous alternatives. System Road 15N13, previously discussed, would have the greatest single cumulative effect in the Goose Creek watersheds. Road 17N32 in the Little Jones Creek watershed and 18N02 have been discussed, but they have the potential for large impacts within their respective watersheds. Route 18N02, which was previously described in cumulative effects under alternative 4 would have the same cumulative effects as that alternative, but the probability of increased risk would not be the same for this alternative because it is not proposing to designate UAR 18N02.3, as is being proposed under Alternative 4.

There were 86 high-risk roads (139.29 miles). Of these, 33 (55.91 miles) access POC stands that were completely uninfected, and 17 (47.69 miles) accessed a mixture of uninfected and infected POC stands, and thirty (35.69 miles) accessed infected POC stands. There were also 120 high-risk routes (67.52 miles). Of those proposed to be designated, seven would access infected stands at least 7 times, and one would accesses a mixture of an infected stand and an uninfected stand. All but one of the UARs proposed to be restored would be barricaded to prevent unauthorized motor vehicle access. Mitigation for roads with an ML 1 rating or greater would be road surface improvement with the addition of gravel. Two UARs would be designated as ML 1. These would be barricaded. The same as alternative 4, high-risk UARs that are proposed to be restored, ML 1 system roads, along with those proposed to be decommissioned were treated in this analysis as low risk and not analyzed. This resulted in10 current high-risk ML 2 roads (23.15 miles) that would be maintained at this operating level but would include road surface improvements.

As discussed in Alternative 4, System Road 15N13 would have the greatest potential impact to the 6th-field Goose Creek watershed. Within this larger watershed, it accesses the Upper Goose Creek watershed, which is currently uninfected. Introduction of PL along either road into the watershed would put 15 percent of the Upper Goose, 42 percent of the Middle Goose and 45 percent of the Lower Goose Creek watersheds at increased risk.

Many of the roads that were discussed in Alternative 4 are proposed for a change in ML level, either eliminating them altogether through decommissioning or downgrading them to an ML 1. Of those discussed in Alternative 4, NFTS roads 15N13, 17N36, 18N16, 15N38 and 1811 would be maintained at an ML 2 or higher level. Cumulative effects from these roads would be the same as those discussed in Alternative 4. Also as in Alternative 4, System Roads 15N13 and 17N36 would have the greatest impact to uninfected watersheds. Roads 18N02, 18N16 and 18N11 would have the potential for increased risks to their respective watersheds.

The greater effect of this alternative would be the potential introduction of PL into the Goose Creek watershed via access with System Road 15N13, which would put almost 425 acres of POC at increased risk. All high-risk roads discussed above would have seasonal restrictions. Timely closure of gates and successfully restricting traffic beyond the gates during closure periods would minimize the risks of spreading PL and any cumulative effects described above associated with disease into the respective drainages.

As discussed in Alternative 4, all high-risk roads discussed above would have seasonal restrictions. Timely closure of gates and successfully restricting traffic beyond the gates during closure periods would minimize the risks of spreading PL and any cumulative effects described above associated with disease into the respective drainages.

Alternative 6

This alternative proposes designating 54 high-risk UARs (including motorized vehicle trails) to the NFTS, changing maintenance level to 30 high-risk existing roads, which includes decommissioning, and designating season-of-use. It also proposes to maintain five ML 1 high-risk roads, 41 ML 2 high-risk roads, and two ML 3 high-risk roads. Actions analyzed in this alternative are summarized below.

Indicators: Both indicators were used.

Routes designated to the existing NFTS: Approximately 27 miles of high-risk motorized routes would be designated to the NFTS.

Changes to the existing NFTS: Approximately 37 miles of existing high-risk NFTS motorized routes would be changed to a new motorized designation (20.85 miles downgraded and 16.36 miles decommissioned).

Seasonal closure: Seasonal restrictions would prohibit motorized use of NFTS routes (51 miles) during periods of wet weather in the project area.

Direct and Indirect Effects to designation of new facilities (roads, trails) to the NFTS.

Fifty-four high-risk routes (26.50 miles) would be designated under this alternative. Four (9.43 miles) would be designated as ML 1, ten (2.57 miles) as ML 2, three (0.39 miles) as ML 3 and thirty-seven (14.11 miles) as motorized trails. Twenty designated UARs would access uninfected POC stands directly or indirectly via stream crossings at least 27 times, and 6 designated UARs would access a mixture of infected and uninfected stands at least seven times.

Direct effects to designating high-risk UARs to the NFTS would be improved access to approximately 450 acres of uninfected POC.

Almost all the high-risk UARs discussed in the effects of Alternative 4 would be proposed to be designated to this alternative. The exceptions are UAR 17N49.12, UAR 315.3, UAR 305.121, UAR 305.123 and UAR 305.130, all of which would be barricaded. Three of the routes that would be designated under this alternative, however, would differ from Alternative 4 in the following ways. UAR 14N15.1, within the Goose Creek watershed would be designated as an ML 1 road and have a year-round gate installed. UAR 15N01.A4 would be designated as on ML 1 and have a year-round gate. 15N01.102 would have the right spur not designated and barricaded, and the left spur would be graveled at the end where water pools. Designating the two routes within the Goose Creek drainages as ML 1 roads would reduce the risk to a total of almost 600 acres of uninfested POC.

All other designated high-risk routes accessing uninfested POC would have the same mitigations as in Alternative 4.

This alternative would put approximately 5.1 percent of POC on the district at increased risk from authorized access by designating UARs as system roads.

Direct and indirect effects to changes to NFTS and seasonal closures.

Thirty high-risk roads (37.21 miles) are proposed to change maintenance level. Nine (8.71 miles) would be downgraded to ML 1, two downgraded to ML 2 (12.14 miles), and 19 (16.36 miles) decommissioned. Eighteen high-risk routes (51.00 miles) are proposed to be restricted seasonally with POC gate closures. Thirteen existing NFTS roads (43.13 miles) would be restricted seasonally with POC gate closures, and five designated UARs (7.69 miles) would have seasonal gate closures.

Just like the other action alternatives, high-risk routes downgraded to ML 1 and decommissioned would result in a low risk rating and are not further analyzed. Also as stated in the other alternatives, seasonal gate closures would reduce the risk of introducing PL beyond the gate location, and gate closures are only as good as the timing of enforcement and the ability to prevent vehicle traffic from circumventing the gate.

Cumulative Effects

There were 79 high-risk roads (140.92 miles) with actions proposed in this alternative. Thirty-three (55.32 miles) accessed POC stands that were completely uninfected, 18 (48.82 miles) accessed a mixture of uninfected POC stands and uninfected POC stands, and 28 (36.78 miles) accessed infected POC stands. There were also 124 high-risk UARs (68.18 miles). Of those proposed to be designated, 27 would access infected stands at least 28 times, and six would access a mixture of infected and uninfected stands at least seven times. These high-risk UARs accessing infested stands would be mitigated by improving the surface conditions, primarily by adding gravel to the surface. A few UARs would be designated as ML 1. These would not have mitigations because of this operational status, but they would be barricaded. All but one of the high-risk UARs being proposed for restoration would be barricaded to restrict unauthorized motor vehicle access. The one exception would be accessed from an existing non-motorized trail network. All others would have physical barriers installed on the route itself or would be restricted from the parent road proposed for decommissioning. High-risk UARs proposed to be designated as ML 1 were treated in this analysis as Low Risk, which included UARs accessing infected and non-infected POC stands. Existing high-risk roads that would be proposed for decommissioning were treated likewise. There would be 43 high-risk ML 2 roads being maintained at this level. Seventeen (18.06 miles) would pass through only infected POC stands, 13 (45.10 miles) would pass through a mixture of infected stands and uninfected stands, and 13 (30.32 miles) would pass through uninfected stands. Two ML 3 roads (2.60 miles) would be maintained at this level. All ML 2 and ML 3 roads proposed to be maintained at their current maintenance level would include road improvements. Improvements typically would involve brushing the road edges and increasing drainage from the road surface. Brushing would have little effect in either increasing or reducing risk. Improving road drainage prevents water from pooling, which reduces concentrating PL spores so this may reduce the risk of infecting nearby stands.

The high-risk NFTS routes that have the greatest potential to affect POC stands have been discussed in previous alternatives. These are 14N01D, 15N13, 16N18A and 17N36. Other system roads that would pose an increased risk in this alternative, which have been described in previous alternatives, are 15N02, 15N38, 16N03K, 16N16, 16N19, 16N32, 16N33, 17N32, 17N40, 18N02, 18N11, 18N16, 18N17, and 18N17C, and their cumulative effects have been discussed in previous alternatives.

Climate change would have unknown effects on the spread of PL. Cumulative effects based on climate change are speculative. The greatest effect would be increased rainfall or rainfall occurring during the time of year when seasonal gates would be generally open. Timely closure of gates is critical in maintaining adequate mitigation in areas where these restrictions are in place. If rainfall seasonality patterns changed, gate closure dates would have to be re-evaluated and changed.

Summary of Effects Analysis across All Alternatives

Alternative 1

This alternative (No Action) puts as much as 3,546 acres of uninfected POC stands at risk, which is the highest risk to POC when compared to the other alternatives. It would also not offer increased motorized access and motorized recreational opportunities when compared to the action alternatives. Approximately 3,300 acres of POC are currently infested, and risks from this alternative could more than double that amount.

Alternative 4

This alternative would put as much as 1,068 acres of uninfected POC stands at risk, which is the second riskiest alternative with respect to uninfected POC stands. This alternative would offer the most motorized access and motorized recreational opportunities when compared to the other alternatives. Over half of the acres put at risk would primarily be from designating UAR 14N15.1 as an ML 2 road within the Upper Goose Creek drainage, which is currently uninfected and contains over 500 acres of uninfected POC stands. Alternative 6 also proposes to designate this route, but it would be designated as an ML 1, which would be closed to the public and further mitigate the risk. Alternative 4 would only have one UAR mitigated with a year-round gate that accesses 185 acres and 14 UARs that would be mitigated with seasonal gates, which access 834 acres. Nine UARs with are proposed to be graveled, which access 49 acres, and 93 UARs would be barricaded, reducing access to 2,478 acres.

Alternative 5

This alternative would have the least risk to uninfected POC stands, approximately 17 acres. It would also designate the least amount of high-risk UARs to the NFTS road network, and it would decommission more high-risk NFTM roads than the other action alternatives. These actions would greatly reduce risks to uninfected POC stands, but it would also offer the least amount of motorized access and motorized recreational opportunities, when compared to the other alternatives. Alternative 5 has the least risk to POC with 113 UARs proposed to be barricaded to reduce access to 3529 acres of uninfected POC. It would have no UARs that would be mitigated with gates, and two UARs that would be mitigated with gravel accessing 17 acres.

Alternative 6

This alternative puts approximately 450 acres of uninfected POC stands at risk, which is the third riskiest alternative with respect to uninfected POC. Much of this risk would be due to access to the Upper Goose Creek watershed through existing NFTS roads. This alternative would offer the second most motorized access and motorized recreational opportunities when compared to the other alternatives. It provides less motorized access opportunities than Alternative 4 but much more than Alternative 5. Alternative 6 has 10 proposed UARs that would be mitigated with gates, two that would be mitigated with year-round gates effecting 705 acres and eight that would be mitigated with seasonal gates effecting 253 acres. Seven UARs are proposed to be mitigated with gravel effecting 84 acres. There would be 111 UARs proposed to be barricaded reducing access on 2,504 acres.

Table 3-86 is a summary of the indicators by alternative.

Table 3-86. Summary of effects analysis across all alternatives, POC root disease.

Indicator	Alt 1	Alt 4	Alt 5	Alt 6
Number of Times High-Risk UARs Directly Accessed Uninfected POC Stand or Indirectly Accessed Uninfected POC Stand within 300 meters of Stream Crossings	83	33	7	27
Acres of Uninfected POC at increased risk by mitigation – least risk to greatest risk	3,546	1,068	17	1,042
• Barricade	0	2,478	3,529	2,504
• Year-round gate	0	185	0	705
• Seasonal gate	0	834	0	253
• Gravel	0	49	17	84
• No mitigation	3,546	0	0	0

The table above indicates that Alternative 1 has the greatest risk to POC from unimpeded access points for a motor vehicle carrying infested mud. It also has the greatest risk to the largest amount of uninfested POC acres when compared to any of the action alternatives. This increases the risk of the disease being established in the stand. Alternative 5 has the least risk of introducing the disease into uninfected stands and the least number of acres put at risk.

Discussion

This analysis was designed to identify risks to POC from potential impacts made by management decisions affecting the NFTS. When risks were identified, mitigations were put in place to minimize the risks. However, mitigating risk does not eliminate risk. Acknowledging this, there is the potential for the continued spread of POC root disease through management activities associated with this project. The Forest Service Manual (FSM) states “Maintain viable populations of all native…. plant species in habitats distributed throughout their geographic range on NFS lands” (FSM 2670.22) and “if impacts cannot be avoided, analyze the significance of potential adverse effects on the population or its habitat within the area of concern and on the species as a whole” (FSM 2670.32).

When comparing potential effects to POC at the project level to the distribution of the species as a whole, the native range of POC is from coastal southwest Oregon, and inland Curry County, southward to east of Eureka, California with a disjunct population near the Sacramento River, north of Redding, California. Approximately 137,545 acres of POC have been mapped within this area. Port-Orford-cedar root disease is found throughout most of the range of POC, approximately 8 percent of mapped populations. Within the project analysis area, 3,546 acres of POC would have the greatest potential risk (Alternative 1). If these acres were to become infected it would increase the amount of infested acres on the district from 16 percent to 30 percent, almost a twofold amount. However, at the range of POC, the increase would be a 2 percent increase, from 8 percent to 10 percent. The potential percentage increase over the range of POC from any of the action alternatives could range from almost no increase at all (Alternative 5), to a 0.8 percent increase (Alternative 4). Even though it is beyond the scope of this document to determine if the risk to POC based on the implementation of any of the project’s proposed alternatives represents a subsequent risk to viability of the species as a whole, any of the proposed action alternatives represent the least risk to POC at the range of its natural occurrence.

Compliance with the Forest Plan and Other Direction

All resource data is current and spatial accuracy is within federal Geographic Data Committee standards. Analysis and conclusions are based on current scientific literature and referenced throughout this document.

Forest Plan standards and guidelines related to POC management apply. Specifically, this report meets the standards for completing a risk analysis for watersheds containing POC and for projects proposed in areas where the disease is not present. Additionally, this document uses an updated systematic risk model adopted by Region 6 and currently used on Region 5 forests to evaluate the risks to POC through potential changes in the transportation plan and identifies high-risk areas where pro-active disease prevention measures can be implemented if necessary. All alternatives fully meet standards and guidelines related to minimizing the risk of POC root disease spread.

Recreation

Introduction

Nearly all forest visitors, regardless of the purpose for their visit, use roads on the NFTS to reach their destination. Making changes to the NFTS (e.g., designating facilities, prohibiting or allowing motor vehicle use by vehicle type or season of use) changes the diversity of motorized and non-motorized opportunities on the forest. These visitors may be participating in motorized recreation, or utilizing motor vehicles to access trailheads, facilities, destinations, or geographic areas that are utilized for non-motorized recreational activities. This section examines the extent to which the diversity of recreation opportunities are affected by the proposed action and alternatives and the extent to which they are consistent with law, policy, regulation and Forest Plan direction. The *Smith River NRA Management Plan* (Appendix A of the Forest Plan) guides the management of the recreation in the area to conform to the Smith River National Recreation Area Act.

Analysis Framework: Statute, Regulation, Forest Plan, and Other Direction

Regulatory direction relevant and specific to the proposed action as it affects recreation resources includes:

National Forest Management Act (NFMA)

The NFMA sets forth requirements for development of forest plans. The Forest Plan includes standards and guidelines for management of recreation including use of OHVs.

Smith River National Recreation Area (NRA) Act (PL 101-612; 104 Stat. 3209)

The Smith River NRA Act established the Smith River NRA, designated the various wild and scenic river segments within the Smith River NRA, and permits the use of off-road vehicles only on designated routes.

Travel Management Rule, Subpart B (36 CFR 212.50-57)

The responsible official shall consider the effects of designated roads, trails and areas on the provision of recreational opportunities, access needs, and conflicts among uses of NFS lands (36 CFR 212.55(a)).

The responsible official shall consider effects on the following, with the objective of minimizing: Conflicts between motor vehicle use and existing or proposed recreational uses of NFS lands or neighboring federal lands; conflicts among different classes of motor vehicle uses on NFS lands or neighboring federal lands; and the compatibility of motor vehicle uses with existing conditions in populated areas, taking into account sound, emissions, and other factors (36 CFR 212.55(b)).

Six Rivers National Forest Land and Resource Management Plan (1995)

The Forest Plan provides goals for the recreation resource and requires a broad range of developed and dispersed recreation opportunities in balance with existing and future demand. For management and conceptual convenience, possible mixes or combinations of activities, settings, and probable experience opportunities have been arranged along a spectrum, or continuum. This continuum is called the Recreation Opportunity Spectrum (ROS), and planning for recreation opportunities using the ROS is conducted as part of forest planning. The ROS provides a framework for defining the types of outdoor recreation, and identifies that portion of the spectrum a given national forest may be able to provide.

The ROS is divided into six classes: *primitive*, *semi-primitive non-motorized*, *semi-primitive motorized*, *roaded natural*, *rural* and *urban*. Each class is defined in terms of its combination of activity, setting, and experience opportunities (USDA Forest Service 1982). The intent is to use ROS and its associated settings to provide recreation input into forest plans, which in turn may inform forest plan management prescriptions and/or project level planning beyond the programmatic planning used to develop the Forest Plan.

For the purposes of travel management actions, the term *off-highway vehicles* is applied to public motor-vehicle use (highway legal and non-highway legal). How ROS applies to the Forest Plan depends on how it was integrated into the management prescriptions and associated standards and guidelines. On the SRNF, the ROS is incorporated in the programmatic direction, standards, and guidelines for recreation. Standard and guidelines related to the ROS are also incorporated into direction provided on 17 management areas reflecting the capability and suitability of the land to support various activities.

Goals

The Forest Plan (p. IV-125) states several goals for recreation, including:

- Provide a wide range of quality outdoor recreation opportunities, emphasizing the unique character of the Six Rivers by providing access, facilities, and information necessary to meet public demand.
- Incorporate universal design into all developed recreation settings to ensure accessibility and usability for a diversity of visitors.
- Provide quality wild, scenic, and recreational river opportunities along designated rivers, based on the values for which they were designated under the Wild and Scenic Rivers Act.
- Develop designated motorized recreation routes on existing roads and trails, and expand opportunities by creating partnerships with user groups and other agencies.

Direction

The Forest Plan (pp. IV-125 to IV-129) provides the following direction applicable to the recreation resource for this project:

- **General Direction:** The *Recreation Opportunity Spectrum Users Guide* will be used to determine the applicable activities, social settings, and recreational experiences for each ROS class.
- **Dispersed Recreation:** Continue to encourage semi-primitive non-motorized, semi-primitive motorized, and roaded recreation. Emphasize dispersed recreation along the river corridors and existing trails and roads that provide access to the interior of the forest. Provide opportunities for non-motorized and motorized recreation through management of semi-primitive, non-motorized motorized areas.
- **Motorized Recreation:** Provide a range of recreational opportunities to meet the needs of motorized recreationists. Manage motorized recreation to provide for public safety and resource

protection, and to reduce user conflicts. Develop a cooperative effort with state, local, and other agencies, Indian tribes, and user groups to identify potential motorized recreation facilities and interpretive opportunities, where appropriate. Specific routes would be designated at the project level through the NEPA process.

- **Trails:** Develop trail management objectives for all trails included in the forest trail system. These management objectives will be used to identify the standard for each of the forest's system trails.

Standards and Guidelines

Table 3-87 displays recreation standards and guidelines applicable to the travel management analysis on the Smith River NRA.

Table 3-87. Recreation standards and guidelines applicable to travel management analysis on the Smith River NRA (Forest Plan, pp. IV-126 to IV-129).

Reference (Page, S&G)	Standard and Guideline
General Recreation	
IV-126, 18-2	Manage recreation according to the ROS classes described in the ROS User's Guide, as specified in the management prescriptions.
IV-127, 18-8	Work in partnership with local communities, universities, and other agencies to expand recreational facilities, programs, and trails on both public and private lands.
IV-127, 18-9	Remove hazard trees in developed recreation sites, and along roads and trails.
IV-127, 18-10	Provide adequate off-road parking at trailheads to accommodate acceptable levels of use.
IV-127, 18-11	Maintain trailhead information sites that provide safety and effective recreation information.
Dispersed Recreation	
IV-127, 18-15	Manage the trail system to provide for a range of recreational opportunities.
IV-127, 18-16	Manage most trails for multiple uses. Sign to indicate the preferred or desired use type. Restrict specific types of trail use only for reasons of resource protection or user conflicts.
IV-127, 18-17	Provide trailheads at road intersections as needed. Facilities at trailheads will be provided for health and safety or resource protection.
IV-127, 18-18	Trail maintenance will be performed in the following order of priority: 1) Correct trail hazards that endanger public health and safety, 2) prevent resource damage, 3) protect the trail resource, 4) repair, replace, or remove signs or markers, and 5) for the comfort and convenience of the user.
IV-127, 18-19	Depending on ROS class designation, facilities will be installed at areas of concentrated public use to protect the resource and for public health and safety rather than for user convenience.
Motorized Recreation	
IV-127, 18-21	Non-street-legal OHV use is restricted to designated routes.
IV-128, 18-22	Level 2 roads are open to motorized recreation vehicles (including Non-street-legal OHVs), unless otherwise designated closed.
IV-128, 18-23	Roads and trails emphasized for motorized recreation will be signed.
IV-128, 18-24	Road, trail, or area use may be further restricted or prohibited by order of the forest supervisor if necessary to provide for public safety, prevent resource damage, or otherwise serve the public interest.
IV-128, 18-25	Closed routes will be evaluated for obliteration, restoration, or rehabilitation.
IV-128, 18-27	In order to reduce the spread of POC root disease, a risk analysis will be completed for all projects (see 20-7) in watersheds containing POC (see Section 3.10 Port-Orford-Cedar).
Interpretive Services and visitor Information	
IV-128, 18-31	Provide recreation information to users on a 24-hour basis through after-hours kiosks, bulletin boards, or other similar means.
IV-129, 18-32	Use the TREAD LIGHTLY and *Pack it in, Pack it out* programs to inform recreationists and other users about responsible land use ethics.

The Forest Plan also provides the following direction applicable to recreation within the designation categories of Wild and Scenic Rivers for this project:

- **Wild River** (p. IV-28):
    - *Recreation Management*: 1) Manage primarily for ROS class semi-primitive non-motorized. Simple comfort and convenience facilities, such as fireplaces, may be provided as necessary within the river area. 3) Motorized travel on land will occur only on existing routes; no new routes will be constructed.
    - *Transportation and Facilities Management*: 3) No new roads or facilities for motorized travel will be constructed. Minor existing structures may be allowed if compatible with the essentially primitive and natural values of the viewshed.
- **Scenic River** (p. IV-57):
    - *Recreation Management*: 1) Maintain existing ROS class of semi-primitive non-motorized and semi-primitive motorized. Larger scale public use facilities, such as moderate size campgrounds, public information centers, and administrative headquarters are allowed if such structures will be visually screened from the river.
    - *Transportation and Facilities Management*: 5) Roads may occasionally bridge the river area. Short stretches of conspicuous roads and longer stretches of inconspicuous roads are allowed within the river corridor.
- **Recreation River** (p. IV-63):
    - *Recreation Management*: 1) Manage for ROS class of roaded natural, semi-primitive motorized and semi-primitive non-motorized. Campgrounds and picnic areas may be established in close proximity to the river.
    - *Transportation and Facilities Management:* 1) Roads and trails may be constructed. Bridge crossings and numerous river access points may occur.

Effects Analysis Methodology

The Effects Analysis Methodology focuses on the assumptions, methodology, and indicators for addressing the direct and indirect effects of the actions described in Chapter 2 that affect the motorized recreation resource, and the cumulative effects of implementing the alternative. The six actions common to all action alternatives affecting recreation are 1) the designation of new facilities (e.g., UARs designated as motorized trails or roads) to the NFTS, including identifying seasons of use and vehicle class; 2) changes to the existing NFTS (e.g., changing the vehicle class by changing the maintenance, and the season of use); 3) changes to the NFTS by decommissioning roads; 4) restoration of drainage patterns on UARs; 5) the Griffin Creek Bridge repair effort; and 6) changing the ROS designation from semi-primitive non-motorized to semi-primitive motorized near Blackhawk Bar through a project specific plan amendment.

Assumptions Specific to Recreation Analysis

- No cross-country travel is permitted within Smith River NRA according to law. There are no open OHV areas designated under any alternatives for this project.
- No motorized trails will be designated to the NFTS within wild rivers, wilderness or RNAs.
- Changes to non-motorized system trails are not considered in this analysis.
- Maintenance Level 2 roads (roads maintained for high-clearance vehicles) are already open to OHV use.
- The analysis does not include over-the-snow vehicle (OSV) use.
- Unauthorized routes are not included on the current MVUM, and the public does not currently have legal access over them. Any future MVUM will clarify that vehicles are only allowed to park within one car length of designated routes.
- A year-round gate on an ML 1 road has the same functions and effects as a barricade on that same road, for the purposes of analyzing effects to both quiet and motorized recreation.
- Proposed designations to the NFTS will have a beneficial effect on dispersed recreation by providing legal access to dispersed recreation sites, which is also a beneficial effect on the amount of available motorized access to dispersed recreation opportunities.
- An action alternative provides a diversity of designated motorized recreation opportunities that are clearly defined parts of the NFTS (e.g., signing designated roads and motorized trails, while barricading closed and decommissioned roads, and UARs not designated to the NFTS), and this would reduce the likelihood of illegal cross-country motorized travel.
- Proposed designations to the NFTS will have a beneficial effect on motorized recreation opportunities by providing a variety of motorized trail riding experiences and increasing the amount of motorized recreation opportunities (loops, connectors).
- The forest's National Visitor Use Monitoring (NVUM) report accurately expresses the most popular motorized and non-motorized recreation activities for use in this analysis.
- Quiet recreation activities can occur near or away from motorized routes, with or without a non-motorized trail, anywhere on the Smith River NRA.
- The area of influence (dust, noise) on *quiet recreation* opportunities (including in general forest areas, wilderness, RNAs, etc.) from motorized use is one-half mile from motorized routes.
- The population density in population centers within the Smith River NRA is very low; therefore, the area of influence (dust, noise) on *quiet recreation* opportunities is up to the private property boundaries.
- There has never been any use analysis of the UARs and no data exists (traffic counts, etc.). As a result, it would be highly speculative to make assumptions of use levels on the UARs.
- The majority of the motorized public use occurring on NFS land is occurring within the existing NFTS based on observation and NVUM data.

- For each UAR designated on the NFTS as a road or motorized trail for accessing dispersed recreation, a minimum of one site is accessed. In many instances, multiple sites may be accessed through the designation of these routes to the system, but this number acts as a surrogate to determine how many dispersed areas are accessed under each alternative.
- Any motorized trails designated to the system may require stormproofing if needed to prevent or mitigate wear and tear, and will require periodic routine maintenance. These maintenance, mitigation and preventive actions are part of designating motorized trails to the NFTS.
- Recreational use, in general, including motorized recreation, is heaviest during the dry season on the Smith River NRA, and drops off substantially during the wet season, specifically the late fall, winter and early spring.
- Trail class data for new motorized trails are not known at this time and therefore were not specifically analyzed. Trail class is the prescribed scale of development for a trail, representing its intended design and management standards (FSH 2309.18). Since trail grade (percent slope) will be an important factor in determining trail class, trail class data for proposed trails were estimated using GIS spatial analysis of terrain near proposed trails, and these estimates can be found in the project record. The implementation strategy will include refinement of trail class designations or whatever standards are in place at that time.
- It is commonly available information that OHV capabilities have grown markedly in recent decades. Today's machines are much better at handling steeper and harder or rockier ground than they were even 10 years ago. For this reason, motorized trails being newly designated in this project will allow use by all vehicles—OHVs wider than 50 inches and highway-legal vehicles. The terrain or tread on some motorized recreation opportunity trails may be prohibitive to many highway-legal vehicles, and may present a challenge to certain off-road vehicles or operators.

Data Sources

- *Six Rivers National Forest Land and Resource Management Plan* (USDA 1995).
- Project GIS layers and associated tabular data sets.
- *Six Rivers National Forest National Visitor Use Monitoring, FY 2008 Results Report.*
- *Six Rivers National Forest National Visitor Use Monitoring, FY 2013 Results Report.*
- In-house knowledge (e.g., forest protection officers, recreation officers, and resource specialists), as documented in the project file record, including but not limited to responses to comments on this project.
- Public input from two meetings, 2011 to present, and public comments contributed during scoping and during the DEIS comment period.

Recreation Indicators and Effects

Indicator measures are intended to assess how each alternative meets the project's purpose and need and addresses significant issues identified in scoping. Part of the project's purpose was driven by the Travel

Management Rule, which required in the designation process that the Responsible official would need to consider: whether the motorized recreation opportunity has the potential to conflict with other recreation opportunities, specifically non-motorized opportunities; the proximity of motor vehicle use to populated areas or neighboring private and federal lands; the quality of the motorized recreation experience; and the quality of motorized access to dispersed areas for both motorized and non-motorized uses. It also responds to the amount of motorized access available on the unit. Conflicts with other resources (including air quality) are examined in other resource sections. The *Geology* and *Transportation* sections address public safety.

For analyzing the effects of changes to the NFTS by vehicle class and season of use, as well as the designation of UARs to the NFTS as roads or motorized trails, indicator measures were used. Mileage available for each class of vehicle is useful in analyzing the ability of forest users not only to travel around the forest and enjoy motorized recreation opportunities but also to access non-motorized recreation opportunities, such as trailheads, hunting, and dispersed recreation sites for activities such as fishing and camping, which the forest has determined are important based on both NVUM data and public scoping for this project. Mileage for motorized recreation is an indicator of the number and types of experiences available for motorcycles, ATVs, and four-wheel drives (4WDs) in each alternative. The changes to motorized mileages can be used to interpret the level of change in opportunities for motorized and non-motorized users. The details of the proposed seasonal closures (season of use) relate to both the months that motorized recreation will not be allowed to use designated roads, or motorized trails and, conversely, the time of year that conflicts between motorized and non-motorized uses will be minimized. In addition, the effect on non-motorized recreation activities that are accessed by proposed routes is considered. Number of acres located one-half mile away from roads, trails and boundaries serve to analyze the opportunity for non-motorized and *quiet recreation* on the forest in the dry and wet seasons. Finally, to determine the amount of dispersed recreation access provided under each alternative, a method was applied that a minimum of one site is accessed by each route (in many instances multiple sites are accessed, but one site per route is used as a proxy).

Trail difficulty is not included in this analysis, because in accordance with the F*orest Service Trails Management Handbook* (FSH 2309.18), trail class is the current management standard related to ease or challenge of travel. For UARs and NFTS roads proposed as motorized trails under the various alternatives, trail class is not definitively known at this time, and therefore could not be analyzed with confidence. Trail class has been estimated for the various proposed motorized trails, using the slope of the terrain near proposed motorized trails, and these estimates are in the recreation analysis tables located in the project record. Actual trail class for each trail will be assessed and assigned during implementation of this project on trails to be designated on the NFTS.

The short- and long-term timeframes and the spatial boundary for analysis are common to all indicators, and are common to direct, indirect, and cumulative effects.

Short-term timeframe: 1 year.

Long-term timeframe: 20 years.

Spatial boundary: The project area boundary, as described in the *Scope of Analysis* in Chapter 1 of this document, is the unit of spatial analysis when considering effects associated with the addition of facilities and changes to the existing NFTS.

Rationale: The measurement indicators are based on NFMA and Travel Management Rule requirements as well as significant issues raised during internal and public scoping.

Non-Motorized Recreation Opportunity

Indicator 1A (Table 3-88)

Number of acres outside half a mile of an area where motorized use is allowed, or where unintended unauthorized use of unbarricaded UARs might occur.

- **Description:** This measurement indicator looks at the impact of proposed changes to the NFTS on non-motorized recreation (dust, noise, use conflicts). It also addresses the *quiet recreation* issue. This measurement indicator identifies the acreage available for quiet recreation and non-motorized activities without the potential for use conflicts with motorized vehicles for both the dry and wet seasons.
- **Method:** Number of Acres outside half a mile of an area where motorized use is allowed: designated roads, motorized trails in the NFTS for the dry and wet seasons, as well as unbarricaded UARs and county or state roads. This method was determined through a literature review of sound studies and reports listed in the *References Cited* section.

Table 3-88. Acreage outside a half mile of proposed roads, motorized trails, and unbarricaded UARs by alternative.

Indicator	Acres			
	Alt 1	Alt 4	Alt 5	Alt 6
Total non-motorized acres (dry season)	65,215	72,767	94,463	78,144
Net change in non-motorized acres from the No Action alternative (dry season)	0	+7,552	+29,248	+12,929
Total non-motorized acres (wet season)	88,904	95,641	113,984	95,684
Net change in non-motorized acres from the No Action alternative (wet season)	0	+ 6,737	+ 25,080	+6,780

Indicator 1B (Table 3-89)

Miles of roads and motorized trails within half a mile of designated Wild River segments, or Scenic River segments that also have a semi-primitive non-motorized classification within the ROS.

- **Description:** This measurement indicator looks at effects to quiet water-based recreation on designated Wild River segments and Scenic River segments with non-motorized classifications.
- **Method:** Number of miles of newly designated roads, motorized trails, and unbarricaded UARs within designated corridors of Wild River segments (of Wild and Scenic Rivers), or of Scenic River segments where there is also a semi-primitive non-motorized classification within the ROS. Within the project area, Wild River and Scenic River segments are typically designated about one-half mile wide on NFS lands, or a quarter mile on either side of the waterway. Although Wild

River and Scenic River classifications do not preclude designating motorized routes within their boundaries, they do favor less-developed recreation management.

Table 3-89. Miles of newly designated roads, motorized trails, and unbarricaded UARs within designated corridors of Wild River segments, or of Scenic River segments where there is also a semi-primitive non-motorized classification within the ROS.

Road/Route Type	Miles			
	Alt 1	Alt 4	Alt 5	Alt 6
Newly designated roads within designated river corridor	0	0	0	0
Newly designated motorized trails within designated river corridor	0	0	0	0
Unbarricaded UARs within designated river corridor	2.46	0	0	0
Total newly designated travelways within designated river corridor	2.46	0	0	0

Effects to wilderness boundaries and neighboring private, state and federal lands (such as dust, noise, use conflicts).

Indicator 2 (Table 3-90)

Change in the number of miles of roads and motorized trails with public access proposed within one-half mile of populated areas, neighboring state and federal land boundaries, wilderness boundaries, and private land boundaries.

- **Description:** This measurement indicator looks at the impact of proposed changes to the NFTS on wilderness and neighboring private, state and federal lands (dust, noise, use conflicts) by alternative.
- **Method:** This includes UARs designated to the NFTS as ML 2, ML 3, or motorized trails, ML 1 roads upgraded to ML 2 roads, and ML 3 roads downgraded to ML 2 roads. These impacts are lessened by downgrading roads (currently ML 2 or ML 3) to ML 1, or by decommissioning ML 2 roads. Downgrading ML 3 roads to ML 2 roads increases access by allowing use by green-stickered OHVs, which could increase user conflicts by increasing dust and noise effects. Omitted are the effects of converting ML 2 roads to motorized trails, because this change is not likely to have a sizeable effect on the type or amount of traffic on the route, and therefore, would not noticeably affect neighboring lands of different management. This indicator acts as proxy on how much conflict off the NFTS may occur by alternative. This method was determined through a literature review of sound studies and reports listed in the *References Cited* section.

Table 3-90. Miles of changed access within a half mile of wilderness boundaries and neighboring private, state and federal lands by alternative.

Access	Road/Route Type	Miles			
		Alt 1	Alt 4	Alt 5	Alt 6
Increasing Access	Road or motorized trail designations within a half mile of wilderness or neighboring lands	0	16.92	1.74	7.56
	Upgraded roads from ML 1 to ML 2 within a half mile of wilderness or neighboring lands	0	6.05	1.44	1.44
	Upgraded roads from ML 1 to ML 3 within a half mile of wilderness or neighboring lands	0	0	0	0
	Downgraded roads from ML 3 to ML 2 within a half mile of wilderness or neighboring lands	0	3.89	3.89	3.89
Decreasing Access	Downgraded roads to ML 1 within a half mile of wilderness or neighboring lands	0	0.39	14.50	0.66
	Decommissioned ML 2 roads within a half mile of wilderness or neighboring lands	0	0.95	12.69	0.95
Overall	Net change within a half mile of wilderness or neighboring lands (increasing access minus decreasing access)	0	+25.52	-20.12	+11.28

Motorized recreation opportunity.

Indicators 3A-C

Change in road miles by vehicle class (Table 3-91), total miles of motorized trails available by vehicle class (Table 3-92), and number of trail miles accessed from each parking area designated along Road 17N49 (Table 3-93).

- **Description:** These measurement indicators look at effects to the abundance of motorized recreation opportunities by alternative.
- **Method:** The figures showing the change in road miles open for motorized use are the result of totaling the proposed changes to NFTS roads. The following equations show the elements considered to produce the figures in the following three tables:
    - Change in road miles open to motorized use by highway-legal vehicles = ((designation of UAR as ML 2 + designation of UAR as ML 3 + upgrade ML 1 to ML 2) – (downgrade ML 2 to ML 1 + decommission ML 2 roads)).
    - Change in road miles open to motorized use by non-highway-legal vehicles = ((addition of UAR as ML 2 + upgrade ML 1 to ML 2+ downgrade ML 3 to ML 2) – (downgrade ML 2 to ML 1 + decommission ML 2 roads)).

Table 3-91 and Table 3-92 display the total miles of motorized trails available to the various vehicle classes. Table 3-91 looks at the entire project area and Table 3-92 looks at motorized trail miles available from each newly designated trailhead under each alternative.

Table 3-91. Change in NFTS road mileage open to motorized use within the project area by alternative and class of vehicle (Measurement Indicator 3A).

Class of Vehicle	Miles			
	Alt 1	Alt 4	Alt 5	Alt 6
Highway-legal motorcycle, 4WD, passenger car	0	-6.9	-108.9	-26.6
Non-highway-legal 4WD, ATV, motorcycle	0	+8.0	-94.1	-11.7

Table 3-92. Total miles of motorized trails[41] by alternative and class of vehicle (Measurement Indicator 3B).

Class of Vehicle	Miles			
	Alt 1	Alt 4	Alt 5	Alt 6
Passenger vehicles[42]	0.0	66.3	7.4	44.7
Highway-legal high-clearance 4WD (≥50" wide and <50" wide) and dual-sport highway-legal motorcycle	12.4	78.7	19.8	57.1
Non-highway-legal 4WD (≥50" wide), motorcycle, ATV	12.4	78.7	19.8	57.1
Additional miles of motorized trails	0.0	66.3	7.4	44.7

Table 3-93. Description of parking additions by alternative to provide for public safety associated with motorized trails for all vehicles (Measurement Indicator 3C).

Parking Area Identifier	Parking Area Size (acres)	Miles of Motorized Trails			Proposed Vehicle Class[43]	Year-Round Routes
		Alt 4	Alt 5	Alt 6		
Site 4: 17N49.102C Parking	0.03	27.84 miles	2.37 miles	20.82 miles	All Vehicles	**Alt 4 Routes:** 17N49.104B, 17N49.14, 17N49.100 to EMP 3.78, 17N49.107, 17N49.15, 17N49.101, 17N49.108, 17N49.15A, 17N49.102,17N49.11 to EMP 4.49, 17N49.4 to EMP 2.04, 17N49.102A, 17N49.11M, 17N49.7 to EMP 3.06, 17N49.102B, 17N49.11N, 17N49.7A, 17N49.102C, 17N49.11P to EMP 0.18, 17N49.8, 17N49.104 MP 0 to 4.68, 17N49.12, 17N49.104A, 17N49.13 **Alt 5 Routes:** 17N49.102B, 17N49.4 to EMP 1.29, 17N49.102A, 17N49.102C **Alt 6 Routes:** 17N49.104 MP 0 to 3.82, 17N49.15, 17N49.100 to EMP 0.12, 17N49. 104B, 17N49.15A, 17N49.101, 17N49.107, 17N49.4 MP 0 to 2.04, 17N49.102, 17N49.108, 17N49.7 to EMP 3.06, 17N49.102A, 17N49.11 to EMP 4.49, 17N49.7A, 17N49.102B, 17N49.11P to EMP 0.18, 17N49.8, 17N49.102C, 17N49.13, 17N49. 104A, 17N49.14
Site 5: 17N49.8 Parking	0.01	27.84 miles		20.82 miles	All Vehicles	**Alternative 4 Routes:** Same as can be accessed by all parking areas under Alternative 4. **Alternative 6 Routes:** Same as can be accessed by all parking areas under Alternative 6.
Site 1: 17N49.11 North Parking	0.23	27.84 miles		20.82 miles	All Vehicles	**Alternative 4 Routes:** Same as can be accessed by all parking areas under Alternative 4. **Alternative 6 Routes:** Same as can be accessed by all parking areas under Alternative 6.

[41] Dry season access analyzed here, because on the Smith River NRA, motorized and other recreational uses are heaviest during the dry season, and drop off substantially during the wet season.

[42] Highway-licensed vehicles, non-highway-licensed vehicles, and passenger cars may legally access most ML 2 roads and Motorized Trails with the *all vehicles* classification; however, high-clearance vehicles are generally recommended. Where motorized trails provide dispersed recreation access, vehicle clearance is less of an issue.

[43] All vehicles classification permits use by highway-licensed vehicles and non-highway-licensed vehicles.

Parking Area Identifier	Parking Area Size (acres)	Miles of Motorized Trails			Proposed Vehicle Class[43]	Year-Round Routes
		Alt 4	Alt 5	Alt 6		
Site 3: 17N49.11 South Parking	0.05	27.84 miles		20.82 miles	All Vehicles	**Alternative 4 Routes:** Same as can be accessed by all parking areas under Alternative 4. **Alternative 6 Routes:** Same as can be accessed by all parking areas under Alternative 6.
Site 2: 17N49.100 Parking	0.05	27.84 miles			All Vehicles	**Alternative 4 Routes:** Same as can be accessed by all parking areas under Alternative 4.

Motorized Access to Dispersed Recreation.

Indicator 4A-B

Change in the number of dispersed sites accessible by road or motorized trails, including:

- Number of UARs designated as roads that provide dispersed recreation access.
- Number of UARs designated as motorized trails that provide dispersed recreation access.
- Number of downgraded or decommissioned roads where motorized access to dispersed sites is removed.
- **Description:** This measurement indicator looks at the impact of proposed changes to the NFTS on motorized access to dispersed recreation opportunities by alternative.
- **Method:** Indicator 4A analyzes routes proposed for designation to the NFTS as ML 2 roads or motorized trails that are currently UARs. No dispersed recreation sites are accessed by UARs proposed for designation as ML 1 roads, or by ML 1 roads proposed for upgrading. Changes to the existing NFTS roads, such as downgrading or decommissioning that affect access to dispersed recreation access are analyzed in Table 3-94. The number of roads or motorized trails serves as a surrogate for the number of dispersed sites accessed. One site per route is a proxy for evaluating access to dispersed recreation (although in some instances, multiple sites are accessed via a single route).

Indicator 4B in Table 3-95 analyzes changes under the various alternatives to existing system roads that access dispersed recreation sites.

Table 3-94. Change in number of dispersed recreation sites accessed by alternative. Dry season access shown here, as it is the primary camping season on the NRA (Measurement Indicator 4A).

Action	Number of Dispersed Roads or Trails to Dispersed Recreation Sites			
	Alt 1	Alt 4	Alt 5	Alt 6
Designations to NFTS as ML 2 roads to access dispersed recreation	0	16	10	15
Designations to NFTS as motorized trail to access dispersed recreation	0	40	3	39
Year-round changes to existing NFTS accessing dispersed recreation sites (see Table 3-95)	0	0	-2	0
Total number of dispersed recreation sites accessible by motorized vehicles	0	56	11	54

Table 3-95. Changes to the NFTS in each alternative, where existing roads provide dispersed recreation access (Measurement Indicator 4B).

Route – Site	Maintenance Level Status and Alternative Action on Existing Dispersed Roads			
	Alt 1	Alt 4	Alt 5	Alt 6
14N38 – Wooley Bear Springs	ML 2	Seasonal closure; decommission last 0.2 miles	Decommission	Seasonal closure; decommission last 0.2 miles
17N20 – Low Divide Rock Pit	ML 2	Same access	Same access	Same access
17N63	ML 2	Same access	ML 1; barricade	Same access
18N01 – W62/North Shelly Creek Dispersed Camp[44]	ML 2	Decommission at MP 0.10	Decommission at MP 0.10	Decommission at MP 0.10
18N02 – Several sites; Sanger Lake/Stevens Camp area	ML 3	Same access	Seasonal gate at MP 1.75	Seasonal gate at MP 1.75
18N09 – Several sites; Diamond Creek area	ML 2	Seasonal closure at beginning of road	Seasonal closure at beginning of road	Same access
Alternative summary	***No change***	***0 roads effectively removed; 2 seasonal closures***	***2 roads removed (deco or downgrade); 1.5 seasonal closures***	***0 roads effectively removed; 1.5 seasonal closures***

Affected Environment

Historic Recreation Use

Travel has been occurring on the land within the administrative boundary project area for thousands of years with much of this use occurring adjacent to modern travel routes, especially along rivers and ridges.

Historically, a network of trails developed through aboriginal use, miners traveling and hauling supplies to mines (starting in the 1850s), and cattle and sheep that were herded on trailways to grazing lands of the high country. Settlement within the area occurred mostly between the 1890s and the 1920s (Master Title Plats, BLM; and Forest Service Status Atlas, SRNF). Trails were the principal means of travel and transportation in this remote region of northwestern California. Inland communities and homesteaders used trails as commerce routes with the coast. Users actively maintained the trail system, probably as part of a transportation system used for controlling wildfire, getting to fire lookouts and to local homesteads. In 1947, Congress created the SRNF from portions of the Klamath, Siskiyou, and Trinity national forests. The Gasquet Ranger District was included within its boundaries. The principal recreation activities on NFS lands within the area were hunting, hiking and associated dispersed camping. Developed facilities in the area were minimal. In the early 1960s, small developed camping areas began to be developed; facilities consisted of a few vault toilets, picnic tables, and fire rings. These developed facilities were normally found along a state highway or county road located at the lower elevations of the districts.

Logging of private lands within the boundaries of the district was practiced in the 1950s and 1960s, following improvements to the state highway system and development of local lumber mills. On federal lands, timber harvesting peaked during the 1970s and 1980s (USDA 1995; FEIS p. III-160). The road

[44] Decommissioning 18N01 at MP 0.10 will still provide motorized access to existing sites along this road, so the decommissioning action is inconsequential here.

transportation system, consisting of arterial (primary) and collector (secondary) routes mainly along ridges, primarily accessed timber harvest units and consequently further opened access for recreationists.

This road construction, logging, and other land-disturbing activities destroyed much of the historical trail network. However, portions of some of the original trails are included in the current network of recreation trails. Most of the existing system of motorized trails in the forest is located within this watershed and cobbled from portions of some of these original trails used by miners and homesteaders. The rest of the system consists of county roads and NFTS roads, many of which were built over the rest of the original trail system, along with portions of US Highway 199, which bisects the Smith River NRA and follows the Middle Fork Smith River.

Unmanaged off-road or cross-country travel by motor vehicles has not been a substantial influence on the landscape of the Smith River NRA, especially as compared to other national forests in California, because the natural steepness of the terrain in the Smith River NRA greatly limits opportunities for off-road travel. The Smith River NRA differs from many of the national forests in California, and even from some of the more southern units of the SRNF, in its steepness and in the vast extent of steep ground, which has naturally prevented the proliferation of user-created routes on the scale found in other units of the NFS. Similarly, the Smith River NRA Act closed the lands to off-road travel decades before the phrase *forest system road* was defined with the specificity found in the Travel Management Rule, and long before the proliferation of user-created routes was identified by Forest Service Chief Dale Bosworth as one of the *five threats* challenging NFS lands. Additionally, the Smith River NRA differs from many national forest units in California with its relatively low level of visitation and population growth in the neighboring communities. The project area lies completely within Del Norte County, which has more than half of its land base managed by public agencies and not open to urban or suburban development.

There are, however, many user-created dispersed campsites that have been used for decades or even generations, usually in close proximity to a passable route—both NFS roads and old logging or mining routes that are not already NFS roads or trails. In previous iterations of this Smith River NRA travel management project, the Smith River NRA had intended to allow travel within 300 feet of NFS roads to provide vehicle access to these dispersed campsites. However, the current direction to allow vehicles to park within one vehicle length of a designated road necessitated that short routes be designated in order to allow vehicle access to many of these dispersed campsites. In the 2012-2013 scoping process for this project, respondents including Del Norte County provided many of the dispersed recreation routes analyzed for this FEIS. Project staff then visited those sites and inventoried the site characteristics, any associated dispersed access route, and the route length, use level, and condition characteristics. Where existing routes (UARs) longer than one vehicle length were needed to access one or more established, apparent dispersed recreation sites, and the sites and routes were compatible with recreation and other resource values and objectives, those routes were analyzed for inclusion in the NFTS in this project.

Current Recreation Use

According to the NVUM survey conducted on the forest in FY 2008 (USDA 2008b), an estimated 224,000 recreational visitors came to the forest, with a 90 percent confidence interval for this total number falling between 171,500 and 276,500 visitors. The 90 percent confidence interval for the total number of visitors is important because the total number of visitors is an estimate, and the 90 percent confidence interval shows the likely range in which the true number of total visitors fell for that year.

Of those recreational visitors in FY 2008, just over 75 percent came from the north coast of California (Del Norte and Humboldt Counties), with most other visitation that year coming from southern Oregon (Curry, Josephine, and Jackson Counties). It is notable that in 2008, the United States entered a deep economic recession and it was widely observed that travel and tourism were diminished nationwide that year, and that when people did recreate, they stayed closer to home that year. Accordingly, the forest's 2008 NVUM survey indicated that close to 100 percent of recreational visitors that year were from those same northwestern California and southwestern Oregon counties.

In FY 2013, there were an estimated 185,000 national forest recreation visitors to SRNF, with a 90 percent confidence interval for this total number falling between 122,655 and 247,345 visitors. In 2013, approximately 73 percent of recreation visitors were from Del Norte or Humboldt Counties, and 89 percent were from northwest California or southwest Oregon.

Common recreation activities in both the 2008 and 2013 NVUM surveys include relaxing, hiking, nature viewing and studying, other non-motorized activities, wildlife viewing, driving for pleasure, picnicking, and developed camping, as well as other uses as shown in Table 3-96. The Smith River NRA manages five developed fee campgrounds including Panther Flat, Grassy Flat, Patricks Creek, North Fork and Big Flat, which provide 98 developed campsites for public use. Winter recreational activities include fishing, kayaking/rafting, and hiking. The primary season of recreational use on the Smith River NRA is May through October and nearly all forest visitors, regardless of the purpose for their visit, use the roads on the NFTS.

The 2008 NVUM survey reported that on the SRNF, an estimated 24.9 percent of visitors participated in driving for pleasure, while 1.9 percent of visitors participated in OHV use or motorized trail activity during their visit. Only 1.1 percent of visitors reported their primary activity to be either OHV use or motorized trail activity (USDA 2008b), as shown below. Looking at motorized uses together (e.g., OHV use, motorized trail activity, driving for pleasure and other motorized activities), 1.2 percent of visitors to the forest in 2008 reported these activities as their main activity for that visit, compared to 93.9 percent who reported their primary use to be one of the non-motorized uses, including: backpacking, fishing, hiking/walking, horseback riding, bicycling and other non-motorized activities.

Table 3-96. Forest visitor activity participation and primary activity as reported in National Visitor Use Monitoring results (USDA 2008b, USDA 2013).

Activity	2008			2013		
	Percent Participating	Percent as Main Activity	Rank	Rank	Percent Participating	Percent as Main Activity
Relaxing	59.9	15.7	*1*	*2*	41.4	12.5
Hiking / Walking	47.5	11.5	*2*	*3*	28.9	6.6
Viewing Natural Features	47.1	16.8	*3*	*1*	66.5	38.8
Other Non-motorized	34.6	18.1	*4*	*5*	23.7	13.2
Viewing Wildlife	33.7	1.7	*5*	*4*	27.1	0.5
Driving for Pleasure	24.9	3.8	*6*	*6*	15.4	0.3
Picnicking	19.9	3.2	*7*	*7*	11.4	2.2
Developed Camping	15.3	3.3	*8*	*8*	9.2	6.1
Nature Study	14.3	1.0	*9*	*9*	8.7	1.5
Visiting Historic Sites	10.6	0.1	*10*	*17*	2.4	0.0
Fishing	10.4	7.0	*11*	*10*	7.5	5.9
Hunting	7.9	7.2	*12*	*14(a)*	3.5	3.4
Nature Center Activities	5.5	0.0	*13*	*11*	5.2	0.0
Gathering Forest Products	5.4	1.8	*14*	*12*	4.3	0.3
Some Other Activity	5.1	2.4	*15*	*14(b)*	3.5	2.5
Primitive Camping	4.6	2.3	*16*	*15*	2.8	1.5
Non-motorized Water	3.5	1.6	*17*	*16*	2.5	1.9
OHV Use	1.6	1.1	*18*	*20*	0.4	0.0
Bicycling	1.5	0.2	*19*	*13*	4.1	2.5
Resort Use	1.4	0.2	*20*	*18*	0.8	0.0
Backpacking	1.0	0.1	*21*	*22(a)*	0.0	0.0
Other Motorized Activity	0.9	0.1	*22*	*19(a)*	0.5	0.3
Cross-country Skiing	0.8	0.0	*23*	*22(b)*	0.0	0.0
Motorized Trail Activity	0.3	0.0	*24*	*21*	0.3	0.0
Horseback Riding	0.2	0.0	*25*	*22(c)*	0.0	0.3
Motorized Water Activities	0.1	0.0	*26*	*19(b)*	0.5	0.1
Snowmobiling	0.0	0.0	*27(a)*	*22(d)*	0.0	0.0
Downhill Skiing	0.0	0.0	*27(b)*	*22(e)*	0.0	0.0
No Activity Reported	0.0	0.8	*27(c)*	*22(f)*	0.0	0.0

Of recreation visitors in FY 2013, 15.4 percent did some driving for pleasure and 0.7 percent used OHVs during their visit (including motorized trail activities), but 0.0 percent described either of these OHV uses as the primary activity for their visit that year. Motorized access is the primary form of access to non-motorized recreation activities on the forest, including fishing, hunting, camping and non-motorized uses that lead from trailheads. Visitors who identified driving for pleasure as their main activity for that visit were about 0.3 percent of all visitors, so in looking at all motorized uses together (e.g., OHV use, motorized trail activity, driving for pleasure and other motorized activities), 0.3 percent of visitors to the SRNF in 2013 reported any of these activities as their main activity for that visit.

More information about the NVUM program can be found on the NVUM program website *www.fs.fed.us/recreation/programs/nvum/*.

It is commonly available information that OHV capabilities have grown markedly in recent decades. Today's machines are much better at handling steeper and harder or rockier ground than they were even 10 years ago.

Environmental Consequences

Alternative 1 – No Action Alternative

In Alternative 1, the status quo would continue. The current MVUM published in 2009 would remain in effect. Vehicles could park within one car length of a currently designated road or motorized trail, and this would be required on the MVUM. Many popular dispersed recreation sites would be without designated routes.

Direct and indirect effects of designating, decommissioning, and making changes to the NFTS, including changes in maintenance levels and identifying seasons of use.

No facilities will be designated, decommissioned, maintenance levels changed, or season of use changed on the NFTS under this alternative.

Non-motorized recreation

Alternative 1 provides 88,904 acres available for quiet recreation and non-motorized activities in the dry season and 65,215 acres in the wet season that are at least one-half mile from motorized roads and trails, as shown for Recreation Indicator 1A (Table 3-88). Alternative 1 would have no observable effect on non-motorized, quiet recreation that is further than one-half mile from motorized routes or unbarricaded UARs, because no additional routes would be designated, and the area available for quiet recreation would be what it is now.

Alternative 1 would have no effect on quiet recreation within the designations of the Smith River Wild and Scenic River that are managed for quiet recreation opportunities. As with the other alternatives, Alternative 1 has 0 miles of newly designated roads and 0 miles of newly designated trails that fall within designated corridors of Wild River segments (within the Smith River National Wild and Scenic River system), or that fall within designated corridors of Scenic River segments where there is also a ROS classification of semi-primitive non-motorized. Alternative 1 also has 2.46 miles of unbarricaded UARs within these same river corridors, as shown by Recreation Indicator 1B (Table 3-89). This is the existing condition that would continue under the No Action alternative.

All the action alternatives provide more acres for quiet recreation, and all the action alternatives provide zero miles of unbarricaded UARs in river corridors managed for quiet riverine recreation, when compared to Alternative 1.

Wilderness and adjacent ownership

Alternative 1 will not result in changes to the NFTS, therefore no changes are proposed within one-half mile of wilderness and adjacent ownership (Table 3-90). The existing condition would continue, thus Alternative 1 represents no effect to wilderness boundaries and neighboring private, state, and federal lands, because no changes are proposed. Alternative 1 ranks second best, behind Alternative 5, in terms of minimizing new miles (with potential for dust, noise, or user conflicts) within one-half mile of wilderness and adjacent private, state, and federal lands.

Motorized recreation

Alternative 1 would have no effect on motorized recreation. It proposes no changes to the NFTS (Table 3-91). No UARs would be designated to the NFTS, and therefore would not be designated for motorized recreation (Table 3-92). While existing roads and motorized trails shown on the MVUM would remain available for motorized recreation, the quality and diversity of the district's motorized recreation opportunity would not change, as Alternative 1 does not designate any motorized trails. Overall, Alternative 1 ranks third best, behind Alternatives 4 and 6 and ahead of Alternative 5, in terms of miles available for motorized access.

Dispersed recreation

Alternative 1 does not designate UARs to the NFTS that access dispersed recreation sites, which negatively affects opportunities for dispersed recreation, as many popular dispersed recreation sites do not currently have designated roads or trails that provide access to them (Table 3-94). Vehicular access is limited to designated routes per the Smith River NRA Act and illustrated in the current MVUM. Future updates to the MVUM will clarify the legal parking limit requirements within a specified distance of a designated road, and many popular dispersed recreation sites are currently not accessible by motorized travel on the NFTS. Motor vehicle access to some developed and undeveloped trailheads and river access sites would also be prohibited. Sites lacking current NFTS motorized access include, but are not limited to, some on County Road 427 and many along US Highway 199 and County Road 316. Some of these sites provide vault toilet facilities, yet they are currently not accessible via currently designated NFTS roads or motorized trails. There are no decommissioning changes to NFTS roads that access dispersed recreation sites under Alternative 4 (Table 3-95). Overall, all the action alternatives designate more motorized access to dispersed recreation sites than Alternative 1 does.

Cumulative Effects

The No Action alternative would negatively affect dispersed recreation opportunities, as many popular dispersed sites are not afforded legal motorized access. Given that much of the north, middle, and south forks of the Smith River and their tributaries are accessed through forestlands, this would leave little opportunity for people interested in dispersed camping near the rivers to do so within the area. The lack of access to popular dispersed recreation sites may also result in increased use and pressure on existing facilities where routes are designated. This will have a negative effect on dispersed and developed recreation sites, as the concentration of use at designated facilities may exceed the optimum use levels.

Alternative 1 Summary

All the action alternatives provide more acres for quiet recreation, and all the action alternatives also provide zero miles of unbarricaded UARs in river corridors managed for quiet riverine recreation, when compared to Alternative 1; thus, Alternative 1 is the least beneficial for quiet recreation. Alternative 1 ranks second best, behind Alternative 5, in terms of minimizing new miles (with potential for dust, noise, or user conflicts) within one-half mile of wilderness and adjacent private, state, and federal lands. Alternative 1 ranks third best, behind Alternatives 4 and 6 and ahead of Alternative 5, in terms of miles available for motorized access. All the action alternatives designate more motorized access to dispersed recreation sites than Alternative 1 does; thus, Alternative 1 is the least beneficial for dispersed recreation access.

Effects Common to All Action Alternatives

Direct and indirect effects of restoration of drainage patterns on UARs.

The lack of data in general on the amount of illegal use of UARs—intentional or unintentional, makes it difficult to assess the magnitude of possible effects to quiet recreation, although we recognize that preventing even unintended illegal use would have some positive indirect effects on some recreation resources (Table 3-97).

Table 3-97. Miles of UAR being barricaded and restored by alternative.

Action	Alt 1	Alt 4	Alt 5	Alt 6
Miles of UARs barricaded and restored	0	71.2	133.2	92.8
Miles of UARs with no barrier (excluding routes used for special use permit access)	154.8	0	0	0

Non-motorized recreation

Restoring drainage patterns on UARs would not have any direct effects on non-motorized recreation, including water-based non-motorized recreation. In addition, although public awareness of the existing Smith River NRA MVUM can be low and travel may have continued to occur on UARs since its issuance, this use is already prohibited and the MVUM has been freely available to forest visitors. If UARs are not designated to the NFTS as either ML 2 roads or motorized trails, then they will not be available for public motorized use, regardless of whether or not drainage patterns are restored on those routes. Therefore, restoring UARs under any of the action alternatives will have no direct effect to the acres available for non-motorized recreation.

There may be an indirect effect of reducing noise, dust, physical presence, possible use conflicts and displacement by physically preventing illegal use, and the unintended illegal use, of remote UARs where quiet non-motorized recreation exists. This could have an indirect positive effect on non-motorized recreation; however, current data on unintended illegal use are insufficient to quantify the level or magnitude of this effect.

Wilderness and adjacent ownership

Restoring UARs should not have any direct effects on wilderness or adjacent ownership, especially on the longer routes. In addition, although public awareness of the existing Smith River NRA MVUM can be low and travel may have continued to occur on UARs since its issuance, this use is already prohibited. If UARs are not designated to the NFTS as either ML 2 roads or motorized trails, then they will not be available for public use, regardless of whether they are restored. Therefore, restoring UARs under any alternative will have no direct effect to adjacent wilderness and private, state, or other federal lands.

Restoration with barricading may have an indirect positive effect of reducing noise, dust, physical presence, possible use conflicts and displacement by physically preventing unintended illegal use of longer UARs within one-half mile of wilderness or neighboring private, state, or federal lands; however, current data on unintended illegal use are insufficient to quantify the level or magnitude of this effect.

Motorized recreation

Restoring UARs should not have any direct effects on legal motorized access according to the existing MVUM, especially on the longer routes. In addition, although public awareness of the existing Smith River NRA MVUM can be low and travel may have continued to occur on UARs since MVUM issuance, this use is already prohibited and the MVUM has been freely available to forest visitors. If UARs are not designated to the NFTS as either ML 2 roads or motorized trails, then they will not be available for public use, regardless of whether drainage patterns are restored.

There may be a positive indirect effect that restoration and barricading would help the user easily identify legal recreation opportunities, which would reduce unintended illegal use that could bring unpleasant outcomes to the motorized recreation experience.

Dispersed recreation

For dispersed recreation routes, restoration actions should not prevent or have any effect on dispersed recreation access. If UARs are not designated to the NFTS as either ML 2 roads or motorized trails, then they will not be available for public use, regardless of whether they are restored. Therefore, the actual restoring of UARs under any alternative will have no direct or indirect effect on the number of routes available for dispersed recreation. The effects of designating more or fewer routes, which provide access to dispersed recreation sites, are discussed within each alternative.

Direct and indirect effects of Griffin Creek Bridge Rehabilitation.

Non-motorized recreation

Griffin Creek Bridge Rehabilitation should not have any direct or indirect effects on nearby non-motorized recreation, because during the short-term impassability at the beginning of 18N07, motorists—including hikers and campers headed toward a destination—can access forest areas along 18N07 by way of a detour over 18N11, to where it intersects with 18N07. Griffin Creek is classified as a Recreation River segment within the designated Wild and Scenic Smith River, and there will likely be negative but temporary direct effects of construction noise and possible access limitations near the bridge during work periods. Noise effects would cease whenever work stops: in the evenings, weekends, and when the work is completed. The bridge rehabilitation project will be of a short enough duration that its associated noise and access issues will be mitigated by the long-term beneficial effect of having a safely passable bridge in that location.

Wilderness and adjacent ownership

Griffin Creek Bridge Rehabilitation will not have any direct or indirect effects on nearby wilderness or other federal lands. This is because no other federal lands are in the vicinity, and during the short-term impassability at the beginning of 18N07, traffic to the Siskiyou Wilderness can be detoured via 18N11 to a later point along 18N07. There may be a small indirect effect to some private or state-owned lands from short-term traffic diversions to 18N11, because 18N11 passes within a half mile of several private parcels of land. These effects would be of short duration and would cease whenever traffic is able to pass over the Griffin Creek Bridge.

Motorized recreation

Griffin Creek Bridge Rehabilitation will not have any short-term direct or indirect effects on nearby motorized recreation, because during the impassability at the beginning of 18N07, drivers can access other forest areas along 18N07 by way of a detour over 18N11 to its intersection with 18N07. There will be a beneficial long-term effect of maintaining safe motorized access over 18N07 once the Griffin Bridge work is completed.

Dispersed recreation

Griffin Creek Bridge Rehabilitation will not have any direct or indirect effects on dispersed recreation at Sanger Meadows, Sanger Lake, or in the Siskiyou Wilderness. There may be minor indirect effects to dispersed recreation at sites on 18N07 that are west of where 18N11 intersects with 18N07, because people will have to travel farther than usual to access these sites. These undesirable effects would be of short duration and would cease whenever traffic is able to pass over the Griffin Creek Bridge. At the Upper Middle Fork dispersed site, closest to the Griffin Creek Bridge (just under one-half mile away), there will likely also be negative but temporary direct effects of bridge rehabilitation construction noise during work periods. Noise effects would cease whenever work stops: in the evenings, weekends, and when the work is completed. There will be a beneficial long-term effect of maintaining safe dispersed recreation access over 18N07 once the Griffin Bridge work is completed.

Cumulative Effects of Griffin Creek Bridge Rehabilitation.

The *Major Bridge Seismic Retrofit* project at five bridges (US Highways 101 and 199, various locations) (planned, non-Forest Service), considered together with the *CalTrans STAA US Highway 199* project (planned, non-Forest Service) and the *Griffin Creek Bridge Rehabilitation* project, may negatively affect motorized recreation opportunities and dispersed recreation, by potentially delaying forest visitors on their way to recreating on NFTS roads and lands in the short term. However, in the long term, the improvements on US Highways 101 and 199 would positively affect these recreation opportunities by enhancing the safety and durability of the bridge to withstand seismic events.

Alternative 4

Direct and indirect effects of designating, decommissioning, and making changes to the NFTS, including changes in maintenance levels and identifying seasons of use.

Non-motorized recreation

As a result of designating facilities, downgrading and decommissioning existing facilities, Alternative 4 provides 72,767 acres for quiet recreation and non-motorized activities in the dry season—7,552 more acres than the No Action alternative—and 95,641 acres available for quiet recreation and non-motorized activities in the wet season—6,737 acres more acres than the No Action alternative (Table 3-88).

Compared with the No Action alternative, Alternative 4 would have a positive effect on quiet recreation within the designations of the Smith River Wild and Scenic River that are managed for quiet recreation opportunities. As with the other alternatives, Alternative 4 has 0 miles of newly designated roads and 0 miles of newly designated trails that fall within designated corridors of Wild River segments (within the Smith River National Wild and Scenic River system), or that fall within designated corridors of Scenic River segments where there is also a ROS classification of semi-primitive non-motorized. Alternative 4 also has 0.0 miles of unbarricaded UARs within these same river corridors, as shown by Recreation Indicator 1B (Table 3-89). This is 2.46 fewer miles of unbarricaded UARs than found under the No Action alternative, which will improve the quiet river recreation opportunities compared to what would be available under the No Action alternative.

Overall, Alternative 4 would have a direct, positive effect on non-motorized quiet recreation in the undeveloped, more remote areas of the Smith River NRA, when compared with the No Action alternative, in both the wet and the dry season, as well as on river segments managed for quiet recreation values. Alternative 4 provides the smallest positive effect on non-motorized quiet recreation when compared to the Alternatives 5 and 6.

Wilderness and adjacent ownership

Overall, roads and motorized trails access within one-half mile of neighboring wilderness and adjacent ownership will have a net increase of approximately 25.5 miles under Alternative 4. Alternative 4 provides increased motorized access on 23.0 miles of newly designated or upgraded roads and trails; downgrades 3.9 miles of ML 3 road to ML 2, which allows new OHV use on those miles; decommissions 1.0 miles of road; and downgrades 0.4 miles of road to ML 1, resulting in an overall increase of access on 25.5 miles of NFTS roads or motorized trails within one-half mile of wilderness or neighboring private, state, and federal lands (Table 3-90). Downgrading from ML 3 to ML 2 can change the amount or type of traffic on a road, by permitting use by both OHVs and street-legal vehicles. Compared to the no action and other action alternatives, Alternative 4 has the greatest negative effect on neighboring wilderness and adjacent ownership.

Motorized recreation

Alternative 4 has the greatest positive effect on motorized recreation opportunities when compared to all other alternatives. While the NFTS road network is reduced by 6.9 miles for highway-legal vehicles, there is an overall increase of 8.0 miles open for non-highway-legal 4WD vehicles, ATVs, and motorcycles (Table 3-91), with the difference stemming mostly from the downgrading of 15.3 miles of ML 3 roads to ML 2. Alternative 4 designates 66.3 miles of motorized trails (Table 3-92). The motorized trail and OHV riding network (32.7 miles total) along Road 17N49 designated under Alternative 4 is a network of motorized trails (27.8 miles) connected by 17N49, which is downgraded from ML 3 to ML 2 along 4.9 miles of its length and thus will provide connector access for both highway-legal and non-highway-legal vehicles. This loop system is larger than what is proposed under other action alternatives, and will provide for extensive loop opportunities on those motorized trails. Alternative 4 would designate five parking areas along 17N49 to provide safe staging areas in various locations on the proposed trail network (Table 3-93).

Additionally, by downgrading 17N07 from ML 3 to ML 2, Alternative 4 provides long riding loop connections between roads 17N07, 16N19, motorized trail 405.103, and Big Flat Road (County Road 427).

Overall, Alternative 4 provides the greatest positive effects to motorized recreation opportunity when compared to the other action alternatives: by providing the most miles available for motorized recreation across the project area, providing more riding loop opportunities within the motorized trail system and by downgrading 17N07 and a portion of 17N49 from ML 3 to ML 2, and also providing staging areas to safely access the motorized trail network stemming from forest road 17N49.

Dispersed recreation

Alternative 4 has a positive effect on dispersed recreation access compared to the No Action alternative and effectively ties for first place with Alternative 6, by designating motorized access to 56 existing dispersed recreation sites, including campsites, picnic spots, river access sites and trailheads (Table 3-94). Of the six dispersed recreation access roads already on the NFTS under the No Action alternative, two have a new seasonal closure under Alternative 4. One of these routes, 18N09, accesses the Diamond Creek area. This road is remote and is not accessed by high-standard roads, so although it does get use, that use is less than on other areas of the Smith River NRA, and even lower in the wet season. However, these qualities provide a recreational opportunity that differs from many others on the NRA, and is special to users who seek that type of experience. There are no decommissioning changes to NFTS roads that access dispersed recreation sites under Alternative 4 (Table 3-95). Overall, Alternative 4 designates more access to dispersed recreation sites than any of the other action alternatives.

Cumulative Effects

The cumulative effects of the non-Forest Service project, *Del Norte Reclassification of Unpaved County Roads as Compatible for Mixed Use Travel* (DN 305, DN 314, DN 315, DN 316, DN 405, and DN 411), are considered elsewhere in terms of non-motorized recreation, effects on wilderness and neighboring state, federal or private lands, and dispersed recreation. This discussion is in the recreation section, *Activities and Cumulative Effects Common to All Alternatives*.

The reclassification of these county roads will however, have a positive cumulative effect to motorized recreation, by providing greater opportunities for OHV travel. Alternative 4 provides the greatest positive cumulative effect with this county action, compared to all the other alternatives. It especially augments the OHV riding experience connected to Low Divide Road (DN 305), French Hill Road (DN 411) and Big Flat Road (DN 405), by allowing OHV travel between otherwise disconnected, OHV-compatible, motorized trails and ML 2 roads. Additionally, by downgrading 17N07 from ML 3 to ML 2, Alternative 4 provides a long OHV riding loop opportunity that connects 17N07, 16N19, 405.103 (22.1 miles total) and Big Flat Road (DN 405).

Aside from those effects considered in the recreation analysis section, *Effects Common to All Action Alternatives* or *Activities and Cumulative Effects Common to All Alternatives*, there are no cumulative effects of other past, ongoing, or reasonably foreseeable projects, when considered with the direct and indirect effects under Alternative 4.

Alternative 4 Summary

Overall, Alternative 4 would have a direct, positive effect on non-motorized quiet recreation in the undeveloped, more remote areas of the Smith River NRA, when compared with the No Action alternative, in both the wet and the dry season, as well as on river segments managed for quiet recreation values; however, Alternative 4 provides the smallest positive effect on non-motorized quiet recreation when compared to the Alternatives 5 and 6. Compared to the no action and other action alternatives, Alternative 4 has the greatest negative effect on neighboring wilderness and adjacent ownership. Alternative 4 has the greatest positive effect on motorized recreation opportunities when compared to all other alternatives. Alternative 4 has the greatest positive effect on dispersed recreation access compared to the No Action alternative and to the other action alternatives.

Alternative 5

Direct and indirect effects of designating, decommissioning, and making changes to the NFTS, including changes in maintenance levels and identifying seasons of use.

Non-motorized recreation

As a result of designating facilities, downgrading and decommissioning existing facilities, Alternative 5 provides 94,463 acres for quiet recreation and non-motorized activities in the dry season—29,248 more acres than the No Action alternative—and 113,984 acres available for quiet recreation and non-motorized activities in the wet season—25,080 acres more than provided by the No Action alternative (Table 3-88). Overall, Alternative 5 provides a positive direct effect on non-motorized quiet recreation throughout the year (dry and wet seasons), in the undeveloped, more remote areas of the Smith River NRA, when compared with the No Action alternative. When compared to other action alternatives, Alternative 5 provides the greatest positive effect to non-motorized quiet recreation opportunities.

Compared with the No Action alternative, Alternative 5 would have a positive effect on quiet recreation within the designations of the Smith River Wild and Scenic River that are managed for quiet recreation opportunities. As with the other alternatives, Alternative 5 has 0 miles of newly designated roads and 0 miles of newly designated trails that fall within designated corridors of Wild River segments (within the Smith River National Wild and Scenic River system), or that fall within designated corridors of Scenic River segments where there is also a ROS classification of semi-primitive non-motorized. Alternative 5 also has 0 miles of unbarricaded UARs within these same river corridors, as shown by Recreation Indicator 1B (Table 3-89). This is 2.46 fewer miles of unbarricaded UARs than found under the No Action alternative, which will improve the quiet river recreation opportunities compared to what would be available under the No Action alternative. Alternative 5 also has 2.24 fewer miles of unbarricaded UARs than found under Alternative 4, and Alternative 5 matches Alternative 6 in this regard.

Wilderness and adjacent ownership

Overall, roads and motorized trails within one-half mile of neighboring wilderness and adjacent ownership would have a net decrease by approximately 20.1 miles under Alternative 5. Alternative 5 provides increased motorized access on 3.2 miles of newly designated or upgraded roads and trails; downgrades 3.9 miles of ML 3 road to ML 2, which would allow new OHV use on those miles; decommissions 12.7 miles of road; and downgrades 14.5 miles of road to ML 1, resulting in a total decrease of 20.1 miles of NFTS roads or motorized trails within a half mile of wilderness or neighboring lands (Table 3-90). Downgrading from ML 3 to ML 2 can change the amount or type of traffic on a road, by permitting use by both OHVs and street-legal vehicles. Compared to the no action and other action alternatives, Alternative 5 has the greatest positive effect on neighboring wilderness and adjacent ownership.

Motorized recreation

Alternative 5 has the greatest negative effect on motorized recreation when compared to all other alternatives. The NFTS road network is reduced by 108.9 miles for highway-legal vehicles, and reduced by 94.1 miles open for non-highway-legal 4-wheel-drive vehicles, ATVs, and motorcycles (Table 3-91), with the difference stemming mostly from the downgrading of 15.3 miles of ML 3 roads to ML 2. Alternative 5 designates 7.4 miles of motorized trails (Table 3-92). The motorized trail and OHV riding network along Road 17N49 under Alternative 5 totals 7.3 miles long, which includes the 4.9 miles of 17N49 to be downgraded from ML 3 to ML 2 and contains only one, small complete riding loop. Downgrading from ML 3 to ML 2 will provide connector access for both highway-legal and non-highway-legal vehicles. Alternative 5 designates one parking area on 17N49 that connects to this trail network to provide a safe staging area (Table 3-93).

Overall, Alternative 5 has the greatest negative effect to motorized recreation opportunities compared to all other alternatives, by providing the fewest miles available for motorized recreation across the project area, providing only one riding loop opportunities within the designated motorized trail system near 17N49 and by downgrading 17N07 from ML 3 to ML 2 without providing any loop connectors to that road. County Road 427, Big Flat Road, will now also allow mixed use and connects to 17N07, but no loop is formed with these two roads.

Dispersed recreation

Alternative 5 has a small positive effect to dispersed recreation access relative to the No Action alternative, but this is far less of a positive effect than the other action alternatives have on dispersed recreation access. It would designate road or motorized trail access to 13 dispersed recreation sites, including campsites, picnic spots, river access sites and trailheads (Table 3-94); however, Alternative 5 would also downgrade or decommission two of the six existing NFTS roads, 14N38 and 17N63, that access dispersed recreation sites (Table 3-94 and Table 3-95). Alternative 5 also adds seasonal closures to 18N09 and a portion of 18N02. As noted in the dispersed recreation analysis for other action alternatives, one of these routes, 18N09, accesses the Diamond Creek area. This road is remote and is not accessed by high-standard roads, so although it does get use, that use is less than on other areas of the Smith River NRA, and even lower in the wet season. However, these qualities provide a recreational opportunity that differs from many others on the NRA, and is special to users who seek that type of experience. Decommissioning changes to the NFTS under Alternative 5 will have a negative effect to dispersed recreation compared to the No Action alternative. Overall, Alternative 5 provides motorized access to 11 more dispersed recreation opportunities than the No Action alternative, but this is the least benefit when compared to other action alternatives.

Cumulative Effects

The cumulative effects of the non-Forest Service project, *Del Norte Reclassification of Unpaved County Roads as Compatible for Mixed Use Travel* (DN 305, DN 314, DN 315, DN 316, DN 405, and DN 411), are considered elsewhere in terms of non-motorized recreation, effects on wilderness and neighboring state, federal or private lands, and dispersed recreation. This discussion is in the recreation section, *Activities and Cumulative Effects Common to All Alternatives*.

The reclassification of these county roads will however, have a positive cumulative effect to motorized recreation compared to the No Action alternative, by providing greater opportunities for OHV travel, especially on longer motorized trails connecting to Low Divide Road (DN 305), French Hill Road (DN 411) and Big Flat Road (DN 405). Although this county action will have a positive cumulative effect to motorized recreation by providing greater opportunity for OHV travel, this effect will be a much smaller positive effect than what is found under Alternative 4, because Alternative 5 provides fewer motorized trails and ML 2 roads that lead away from these county roads than Alternative 4, especially extending from the Low Divide Road (DN 305). Also, because Alternative 5 downgrades 16N19 from ML 2 to ML 1, it does not provide any additional long OHV riding loop opportunity between Big Flat Road (DN 405 at its junction with DN 411), 17N07 (ML 2), and 405.103 (motorized trail), unlike the other action alternatives. Alternative 5 provides a positive cumulative effect with this county action compared to the No Action alternative, and Alternative 5 provides the smallest positive cumulative effect in this regard when compared to the other action alternatives.

Aside from those effects considered in the recreation analysis section, *Effects Common to All Action Alternatives or Activities* and *Cumulative Effects Common to All Alternatives*, there are no cumulative effects of other past, ongoing, or reasonably foreseeable projects, when considered with the direct and indirect effects under Alternative 5.

Alternative 5 Summary

When compared to other action alternatives, Alternative 5 provides the greatest positive effect to non-motorized quiet recreation opportunities. Compared to the no action and other action alternatives, Alternative 5 has the greatest positive effect on neighboring wilderness and adjacent ownership. Alternative 5 has the greatest negative effect on motorized recreation when compared to all other alternatives. Finally, regarding motorized access to dispersed recreation, Alternative 5 has a small positive effect relative to the No Action alternative, but this is far less of a positive effect than found in the other action alternatives.

Alternative 6

Direct and indirect effects of designating, decommissioning, and making changes to the NFTS, including changes in maintenance levels and identifying seasons of use.

Non-motorized recreation

As a result of designating facilities, and downgrading and decommissioning existing facilities, Alternative 6 provides 78,144 acres for quiet recreation and non-motorized activities in the dry season—12,929 more acres than the No Action alternative—and 95,684 acres available for quiet recreation and non-motorized activities in the wet season—6,780 acres more than provided by the No Action alternative (Table 3-88). Overall, Alternative 6 would result in a positive direct effect to non-motorized quiet recreation in the undeveloped, more remote areas of the Smith River NRA, in both the wet and the dry seasons.

Compared with the No Action alternative, Alternative 6 would have a positive effect on quiet recreation within the designations of the Smith River Wild and Scenic River that are managed for quiet recreation opportunities. As with the other alternatives, Alternative 6 has 0 miles of newly designated roads and 0 miles of newly designated trails that fall within designated corridors of Wild River segments (within the Smith River National Wild and Scenic River system), or that fall within designated corridors of Scenic River segments where there is also a ROS classification of semi-primitive non-motorized. Alternative 6 also has 0 miles of unbarricaded UARs within these same river corridors, as shown by Recreation Indicator 1B (Table 3-89). This is 2.46 fewer miles of unbarricaded UARs than found under the No Action alternative, which will improve the quiet river recreation opportunities compared to what would be available under the No Action alternative. Alternative 6 also has 2.24 fewer miles of unbarricaded UARs than found under Alternative 4, and Alternative 6 matches Alternative 5 in this regard.

Overall, Alternative 6 has a positive direct effect to non-motorized quiet recreation in the undeveloped, more remote areas of the Smith River NRA, in both the wet and the dry seasons and in river corridors managed for quiet riverine recreation; thus, Alternative 6 ranks second best, behind Alternative 5, for quiet recreation.

Wilderness and adjacent ownership:

Overall, roads and motorized trails within one-half mile of neighboring wilderness and adjacent ownership will have a net increase by approximately 11.3 miles under Alternative 6. Alternative 6 will provide increased motorized access on 9.0 miles of newly designated or upgraded roads and trails, downgrade 3.9 miles of ML 3 road to ML 2 which would allow new OHV use on those miles, decommission about 1.0 mile of road, and downgrade 0.7 miles of road to ML 1 resulting in a total increase of 11.3 miles of NFTS roads or motorized trails within one-half mile of wilderness or neighboring lands (Table 3-90). Downgrading from ML 3 to ML 2 can change the amount or type of traffic on a road, by permitting use by both OHVs and street-legal vehicles. Compared to the No Action alternative, Alternative 6 negatively affects neighboring wilderness and adjacent ownership, albeit less than found under Alternative 4.

Motorized recreation

Alternative 6 has an overall positive effect on motorized recreation when compared to the No Action alternative; Alternative 6 is less positive than Alternative 4 and less negative than Alternative 5, and thus moderates the extremes of the other action alternatives. The NFTS road network in Alternative 6 is reduced by 26.6 miles for highway-legal vehicles, and reduced by 11.7 miles open for non-highway-legal 4-wheel drive vehicles, ATVs, and motorcycles (Table 3-91), with the difference stemming mostly from the downgrading of 15.3 miles of ML 3 roads to ML 2. Alternative 6 designates 44.7 miles of motorized trails (Table 3-92). The motorized trail network and OHV riding network (25.7 miles long) designated along Road 17N49 under Alternative 6 is a broad network of motorized trails (20.8 miles), similar to but not as extensive as what is proposed under Alternative 4. As with Alternative 4, the new trails are connected by 17N49, which is downgraded from ML 3 to ML 2 along a portion of its length and thus will provide connector access for both highway-legal and non-highway-legal vehicles, and will provide for extensive loop opportunities without the need for frequent trailering of OHVs. Alternative 6 designates four parking areas along 17N49 to provide safe staging areas in various locations on the new proposed trail network (Table 3-93).

Additionally, by downgrading 17N07 from ML 3 to ML 2, Alternative 6 provides the same long riding loop connections to this road as does Alternative 4, and the analysis of this loop is the same as was discussed under the environmental consequences to motorized recreation under Alternative 4.

Given the overall increase in motorized recreation opportunities, the loop opportunities afforded by the downgrading of 17N07 and a portion of 17N49 from ML 3 to ML 2, and staging facilities to allow for safe access to the motorized trail network, Alternative 6 is second best, compared to Alternative 4, in positive effects to motorized recreation opportunities, when compared to the other alternatives.

Dispersed recreation

Alternative 6 results in a clear positive effect to dispersed recreation access compared to the No Action alternative, and of the action alternatives, it has a positive effect that effectively ties for first place with Alternative 4. Alternative 6 designates motorized access to 54 dispersed recreation sites, similar to Alternative 4 (Table 3-94). Of the six dispersed recreation access roads already on the NFTS under the No Action alternative, one and a portion of a second road would become seasonally closed, slightly better than what is offered by Alternative 4. Unlike the other action alternatives, Alternative 6 has no seasonal closure at the north end of 18N09, which accesses several dispersed recreation sites in the Diamond Creek area, and instead has a permanent barrier at the south end of 18N09. This road is remote, is not accessed by high-standard roads, and the use is less than on other areas of the Smith River NRA. However, these qualities provide a recreational opportunity that differs from many others on the NRA, and is special to the users that seek that type of experience, especially during hunting season, which often overlaps with the wet season. There are no decommissioning changes to NFTS roads that access dispersed recreation sites (Table 3-95). Alternative 6 provides motorized access to many popular or regularly used dispersed recreation sites on the Smith River NRA.

Cumulative Effects

The cumulative effects of the non-Forest Service project, *Del Norte Reclassification of Unpaved County Roads as Compatible for Mixed Use Travel* (DN 305, DN 314, DN 315, DN 316, DN 405, and DN 411), are considered elsewhere in terms of non-motorized recreation, effects on wilderness and neighboring state, federal or private lands, and dispersed recreation. This discussion is in the recreation section, *Activities and Cumulative Effects Common to All Alternatives*.

The reclassification of these county roads will however, have a positive cumulative effect to motorized recreation, by providing greater opportunities for OHV travel. Alternative 6 provides a substantial positive cumulative effect with this county action, although this positive effect is not as great as is found under Alternative 4, because fewer miles of motorized trails are added in the Low Divide Area under Alternative 6 than are added under Alternative 4. However, this county action still augments or benefits the OHV riding experience connected to Low Divide Road (DN 305), and also on French Hill Road (DN 411) and Big Flat Road (DN 405), by allowing OHV travel between otherwise disconnected, OHV-compatible, motorized trails and ML 2 roads. Additionally, by downgrading 17N07 from ML 3 to ML 2, Alternative 6 provides a long OHV riding loop opportunity that connects 17N07, 16N19, 405.103 (22.1 miles total) and Big Flat Road (DN 405), and this opportunity is the same as can be found under Alternative 4.

Aside from those effects considered in the recreation analysis section, *Effects Common to All Action Alternatives or Activities* and *Cumulative Effects Common to All Alternatives*, there are no cumulative effects of other past, ongoing, or reasonably foreseeable projects, when considered with the direct and indirect effects under Alternative 6.

Alternative 6 Summary

Overall, Alternative 6 has a positive direct effect to non-motorized quiet recreation in the undeveloped, more remote areas of the Smith River NRA, in both the wet and the dry seasons and in river corridors managed for quiet riverine recreation; thus, Alternative 6 ranks second best, slightly better than Alternative 4 and behind Alternative 5, for quiet recreation. Compared to the No Action alternative, Alternative 6 negatively affects neighboring wilderness and adjacent ownership, albeit less than found under Alternative 4. Alternative 6 is second best, compared to Alternative 4, in positive effects to motorized recreation opportunities, when compared to the other alternatives. Alternative 6 results in a clear positive effect to dispersed recreation access compared to the No Action alternative, and of the action alternatives, it has a positive effect to dispersed recreation that effectively ties with Alternative 4 for first place.

Cumulative Effects

Discussion and Analysis Framework

Regarding cumulative effects analysis, fully implemented past projects are part of the existing condition—their effects are considered part of the existing condition. The following ongoing, or reasonably foreseeable future projects, along with this Project are considered for potential cumulative effects on various aspects of the recreation resource. The details of these ongoing and future projects are discussed in detail in the cumulative effects summary for the project, dated January 20, 2016, located in the Project Record in the forest supervisor's office in Eureka, California. The temporal and spatial contexts are the same as what is provided in the introduction to the *Recreation Analysis Indicators* section in this chapter.

Activities and Cumulative Effects Common to All Alternatives

The following discussion identifies the past, present and reasonably foreseeable future projects that are considered in the cumulative effects analyses to the recreation resource. Although people may recreate throughout the forest, most users utilize either known dispersed or developed recreation sites, including trailheads. Non-recreation projects will generally only have cumulative effects to recreation resources where they affect developed or dispersed recreation sites, or access to such sites. In general, these ongoing and future projects provide small cumulative effects to the recreation resource, because the major influences on or consequences to the recreation resource are provided by the direct and indirect effects of the *Smith River National Recreation Area Restoration and Motorized Travel Management* project. Similarly, the influence of ongoing and future projects is not magnified or lessened by the direct and indirect effects of the various alternatives in this project. The cumulative effects analyses and determinations that are specific to each alternative are presented under the corresponding alternative(s) in this *Environmental Consequences* section.

The *Hurdygurdy Recreation Improvement* project (a Forest Service project) will have a positive cumulative effect on dispersed recreation access available to the public, especially in the lower Hurdygurdy Creek area. Because the routes accessing these recreation sites are already designated and are thus part of the existing condition, there would be no additional negative cumulative effect to non-motorized quiet recreation from this action.

The *Hurdygurdy Bridge Replacement* project (non-Forest Service project), is a new two-lane bridge on County Road 405. The bridge will be an improvement over the single span structure now in place. In the long term, this project will cumulatively affect public safety, which will have a beneficial effect on dispersed recreation, by providing safe passage to and between the various dispersed recreation sites in the lower Hurdygurdy Creek area. In the short term (during construction), the *Hurdygurdy Bridge Replacement* project may have a local, small negative effect on dispersed recreation access by slight delays caused by construction or negotiating the detour, especially to access recreation sites north of the bridge. One dispersed site near the bridge would not be available during the bridge replacement project, but would be otherwise protected from project activities. This project would not substantially affect motorized recreation access, because the number of miles available for motorized recreation would not be affected.

The *Major Bridge Seismic Retrofit* project at five bridges (US Highways 101 and 199, various locations) (non-Forest Service project), considered together with the *CalTrans STAA US Highway 199* project (planned, non-Forest Service) may negatively affect motorized recreation opportunities in the short term, by potentially delaying forest visitors on their way to recreating on NFTS roads; however, in the long term the seismic retrofit would positively affect motorized recreation opportunities by enhancing the safety and durability of the bridge to withstand seismic events.

The *Hurdygurdy Land Acquisition*, Phases 1 through 6 (Forest Service project), considered together with the planned Phase 7 of this purchase (Forest Service project) will have a beneficial cumulative effect on the number of acres available for non-motorized quiet recreation that is farther than one-half mile from motorized roads and trails. These purchases also have a positive cumulative effect of reducing potential conflicts with neighboring private lands, by reducing both the area (square miles) of the private lands in upper Hurdygurdy Creek, and the miles of boundary to be managed between Forest Service and private lands. Additionally, the Forest Service already has road easements across several of these tracts, where NFTS roads cross the private lands; the purchase project will put the land under roads into Forest Service management and this will further reduce potential conflicts with neighboring private lands. The planned

Phase 7 areas of the Hurdygurdy Purchase, if acquired, will provide more of the same cumulative benefits as were described for Phases 1 through 6.

The *Steven Memorial Bridge Replacement* project (non-Forest Service project) has similar cumulative effects as the *Hurdygurdy Creek Bridge Replacement* project. The two-lane replacement to the existing one-lane Steven Memorial Bridge will have a beneficial cumulative effect on public safety and dispersed recreation access; in this case the recreation use centers around the whitewater boating put-in. The Steven Bridge project will also improve the parking and other amenities, which will further benefit dispersed recreation.

The non-Forest Service project, *Del Norte Reclassification of Unpaved County Roads as Compatible for Mixed Use Travel* (DN 305, DN 314, DN 315, DN 316, DN 405 and DN 411), would not have cumulative effects on non-motorized recreation, because county roads are already main thoroughfares and thus were already excluded from the area analyzed for quiet recreation. Although there will likely be some additional use of these roads by OHVs, the amount of general traffic on these roads is already very low, except during hunting season, and even with the additional use, traffic is expected to remain very low. In other words, although there will be more traffic on county roads, the change will not be substantial. These roads are mostly located well away from private lands and neighboring state or federal lands and none are near wilderness. Thus, the cumulative effects of this county project on neighboring state, federal and private lands will be very small, and there will be no effects to adjacent wilderness. This county project will not affect dispersed recreation, since it provides no new access to dispersed recreation sites. The cumulative effects of these reclassified roads on motorized recreation are analyzed separately under each of the alternatives.

There are no cumulative effects from the Gasquet Complex of fires that burned in summer and fall of 2015, because all facilities were restored back to their prior condition as the fires were contained and mopped up. The fires therefore did not notably change recreation access or use on the Smith River NRA.

Importantly, the cumulative effects of all these past, ongoing, and reasonably foreseeable future projects play a small part in the overall effects of the Smith River NRA travel management projects. The major influences on or consequences to the recreation resource are the direct and indirect effects of the project.

Summary of Effects Analysis across All Alternatives

Alternative 1 does not meet the project’s purpose and need (described in Chapter 1) because it does not provide motor vehicle access to dispersed recreation opportunities, which is reflected in the dispersed recreation indicator for Alternative 1. It minimally but poorly provides a diversity of motorized recreation opportunities (4X4 vehicles, motorcycles, ATVs, SUVs, passenger vehicles, etc.), because it designates no motorized trails, but then again also includes no decommissioning or downgrading actions that would reduce motorized access across the Smith River NRA. It also does nothing to reduce risk to ecological and cultural resources associated with the NFTS and UARs.

Alternative 4 meets the project’s purpose and need by providing motor vehicle access to dispersed recreation opportunities, by designating roads and motorized trails to provide a diversity of motorized recreation opportunities, and by barricading all UARs not designated to the NFTS, in order to reduce the associated risk to ecological and cultural resources.

Alternative 5 meets the project’s purpose and need by providing motor vehicle access to a small number of dispersed recreation opportunities, and by barricading all UARs not designated to the NFTS, in order to reduce the associated risk to ecological and cultural resources. Alternative 5 minimally but poorly provides a diversity of motorized recreation opportunities (4X4 vehicles, motorcycles, ATVs, SUVs, passenger vehicles, etc.), because it designates some motorized trails, but then again also includes many decommissioning and downgrading actions across the Smith River NRA that would reduce motorized access.

Alternative 6 meets the project’s purpose and need by providing motor vehicle access to dispersed recreation opportunities, by designating roads and motorized trails to provide a diversity of motorized recreation opportunities, and by barricading all UARs not designated to the NFTS, in order to reduce the associated risk to ecological and cultural resources.

A summary of recreation effects across all alternatives is displayed in Table 3-98.

Table 3-98. Recreation resource effects summary.

Indicator – Recreation Resources	Rankings of Alternatives for Each Indicator[45]			
	Alt 1	Alt 4	Alt 5	Alt 6
Indicator 1: Non-motorized quiet recreation opportunity.	1	2	4	3
Indicator 2: Impact of proposed changes to the NFTS on neighboring private and federal lands (dust, noise, use conflicts).	3	1	4	2
Average ranking for non-motorized values	***2***	***1.5***	***4***	***2.5***
Indicator 3: Motorized recreation opportunity.	2	4	1	3
Indicator 4: Type of motorized access to dispersed recreation.	1	4	2	4
Average ranking for motorized values	***1.5***	***4***	***1.5***	***3.5***

Compliance with the Forest Plan and Other Direction

This section presents the analysis of the compatibility of proposed changes to the NFTS with Forest Plan management prescriptions for recreation, OHV use, and ROS. Alternatives 4, 5, and 6 each require one project specific Forest Plan amendment to the ROS, in order to designate existing UARs that access dispersed recreation near Blackhawk Bar. This would reclassify 1.1 acre from semi-primitive non-motorized to semi-primitive motorized under Alternative 5, and 5.9 acres from semi-primitive non-motorized to semi-primitive motorized under Alternatives 4 and 6 (Table 3-99). Aside from this one Forest Plan amendment to the ROS in each of these alternatives, the action alternatives otherwise comply with the Forest Plan and other regulatory direction, by not designating other new routes or upgrading ML 1 roads in a manner inconsistent with the ROS.

Table 3-99 displays the number of acres in each ROS class by alternative, and the number of acres under the action alternatives required for the single, project-specific Forest Plan amendments to the ROS (and any associated changes to Forest Plan recreation and OHV management prescriptions) by alternative.

[45] A score of 4 indicates the alternative has the least impacts for this resource and is the *best* for this resource; a score of 1 indicates the most impact and is the *worst* for this resource.

Table 3-99. Acreage within ROS classifications, and required non-significant ROS plan amendments by alternative.

ROS Class	Acres			
	Alt 1	Alt 4	Alt 5	Alt 6
Primitive	2,350.78	2,350.78	2,350.78	2,350.78
Semi-Primitive Non-Motorized	60,688.91	60,683.06	60,687.86	60,683.06
Semi-Primitive Motorized	14,485.42	14,491.27	14,486.47	14,491.27
Roaded Natural	178,272.36	178,272.36	178,272.36	178,272.36
Rural	786.95	786.95	786.95	786.95
Urban	0.00	0.00	0.00	0.00
Forest Plan Amendment[46] by Alternative	0.00	5.9	1.1	5.9

Under any of the action alternatives, this project specific Forest Plan amendment supports the provision of motorized access over existing routes historically used by the local community to access the popular swimming areas known as Blackhawk Bar. In other words, this motorized use has been occurring in this semi-primitive non-motorized area since well before the publication of the 1982 ROS Users Guide, but along routes that were not part of the NFTS during the original ROS analysis. The use levels and long-term general popularity of Blackhawk Bar warrant a special-case consideration of a Forest Plan amendment to the ROS designation, in order to provide continued public access to this area.

The Blackhawk Bar routes, listed in Table 3-100, would trigger ROS amendments to the current semi-primitive non-motorized area within a 60- to 70-foot buffer of those routes, and these areas were analyzed for best fit into either the semi-primitive motorized or the roaded natural designations, according to the ROS mapping evaluation criteria (ROS Users Guide 1982). These criteria are listed in Table 3-101.

Table 3-100. New routes requiring non-significant forest plan amendments by alternative.

Description	Alt 1	Alt 4	Alt 5	Alt 6
New Route Additions	None	15N36N.1 15N36N.1A 15N36N.1B 15N36N.1C	15N36N.1	15N36N.1 15N36N.1A 15N36N.1B 15N36N.1C

[46] Changing the ROS classification from semi-primitive-non-motorized to semi-primitive-motorized.

Table 3-101. Recreation opportunity spectrum (ROS) evaluation criteria for semi-primitive motorized and roaded natural area designations.

Setting Component	Conditions	Semi-Primitive Motorized Mapping Evaluation Criteria	Roaded Natural Mapping Evaluation Criteria
Physical	Remoteness	An area designated within one-half mile of primitive roads or trails used by motor vehicles, but not closer than a half mile from better-than-primitive roads.	An area designated within one-half mile from better-than-primitive roads, and railroads.
Physical	Size	2,500 acres[47]	No size criteria.
Physical	Evidence of Humans	Natural setting may have moderately dominant alterations but would not draw the attention of motorized observers on trails and primitive roads within the area. Strong evidence of primitive roads and the motorized use of trails and primitive roads. Structures are rare and isolated.	Natural setting may have modifications, which range from being easily noticed to strongly dominant to observers within the area. However, from (visually) sensitive travel routes and use areas, these alterations would remain unnoticed or visually subordinate. There is strong evidence of designed roads and/or highways. Structures are generally scattered, remaining visually subordinate or unnoticed to observers on the (visually) sensitive travel route. Structures may include power lines, microwave installations, etc.
Social	User Density	Low- to moderate-contact frequency.	Frequency contact is moderate to high on roads, low to moderate on trails and away from roads.
Managerial	Managerial Regimentation and Noticeability	On-site regimentation and controls – which may be physical (such as barriers) or regulatory (such as permits) – are present but subtle.	On-site regimentation and controls are noticeable, but harmonize with the natural environment.

Under all the action alternatives, the route or routes leading to Blackhawk Bar conform best to the semi-primitive motorized ROS evaluation criteria, except regarding the size criteria: these routes are in primitive condition, but still show strong evidence of use as roads or trails; the area has minimal alterations and structures present; user density is generally low; and physical barriers in the area are and would remain subtle. This river segment is classified as *recreational* in the Smith River NRA Management Plan (Forest Plan, Appendix A, 1995), under the Wild and Scenic Rivers Act and in conformance with the Smith River NRA Act. An ROS classification of semi-primitive motorized is consistent with Forest Plan direction for recreational river segments (pp. IV-62 to -63). Although the area sizes proposed for conversion to semi-primitive motorized are well under the 2,500 acres recommended in the ROS Users Guide, the conditions of the site remain semi-primitive despite the motorized use on these currently UARs, and thus the area around the routes proposed for addition under Alternatives 4, 5 and 6, is recommended for the semi-primitive motorized designation in each of those alternatives.

[47] According to the ROS Users Guide, area adjustments for a Primitive or Semi-Primitive class may require individual consideration. If the area is sufficiently added to or buffered by the next contiguous class, then it may still provide the kinds of opportunities, which could more certainly occur if the area were larger. When evaluating whether this condition applies, or whether the area is for some other reason unique relative to the surrounding area and provides a given class of opportunity in spite of its size, utilize site-specific evaluation of the area and its features.

Society, Culture and Economy

Introduction

The *Smith River National Recreation Area Restoration and Motorized Travel Management* project area includes the Gasquet Ranger District and the Smith River NRA, exclusive of lands within congressionally designated Wilderness Areas, and is referred to collectively as the Smith River NRA. The district is within Del Norte County. Natural resources contribute to the quality of life of local residents by providing employment and career opportunities through recreation-related tourism and timber production, income through resource-related jobs and sales of special forest projects, food, and materials for personal and ceremonial uses through subsistence activities, and personal recreation opportunities through access to hiking trails, hunting areas, boating areas, and fishery resources.

- Fishing and hunting are significant elements of these communities' lifestyles and adds to their yearly food supply.
- Fishing, hunting, whitewater rafting, swimming, camping, wildlife photography, bird watching, and OHV driving are the recreational draws to the area.
- The communities' design of its desired future condition includes recreation as a major component of its economy.
- The lifestyle is rural with many families with generational roots in the community attached to a land resource value. A number of people have been attracted to this area by the natural beauty and its environmental features. Family and social values are more important than services and conveniences that are more readily available in highly populated areas.
- Recreation and tourism are seen as the primary areas with the potential to provide for economic stimulus. Infrastructure is needed to support this effort. Recreational facilities, which include trails and safe road systems, are needed.
- The communities' values and lifestyles, as it relates to this project proposal, have a unique history and composition.

Analysis Framework: Statute, Regulation, Forest Plan, and Other Direction

Multiple statues, regulations and executive orders identify the general requirement for the application of economic and social evaluation in support of Forest Service planning and decision making. These include, but are not limited to, the Multiple-Use Sustained Yield Act of 1960 (74 Stat. 215: 16 USC 528-531), National Environmental Policy Act (NEPA) of 1969 (83 Stat. 852; 42 USC 4321, 4331-4335, 4341-4347), and the Planning Act of 1974. In addition, the following guidance also applies:

- Executive Order 12898, issued in 1994 orders federal agencies to identify and address any adverse human health and environmental effects of agency programs that disproportionately impact minority and low-income populations. The Order also directs agencies to consider patterns of subsistence hunting and fishing when an agency action may affect fish or wildlife.

- The Civil Rights Act of 1964 provides for nondiscrimination in voting, public accommodations, public facilities, public education, federally assisted programs, and equal employment opportunity. Title VI of the Act, Nondiscrimination in Federally assisted Programs, as amended (42 USC 2000d through 2000d-6) prohibits discrimination based on race, color, or national origin.

Effects Analysis Methodology

Study Area

The SRNF study area is defined as Del Norte County.

Assumptions Specific to the Socioeconomic Analysis

Motorized activities are enhanced by improvements in ecological conditions.

Data Sources

- *Del Norte County Economic Profile.* 2013. Center for Economic Development, California State University Chico, Chico.
- *Economic Profile System – Human Dimensions Toolkit, EPS-HDT.* 2013. Crescent City CCD, Del Norte County, California. w*ww.headwaterseconomic.org/eps-hdt*.
- *American Indian Population and Labor Force Report.* 2005. Bureau of Indian Affairs.
- *Yurok Forest History.* 1994. Department of Environmental Science, Policy, and Management, University of California at Berkeley.

Affected Environment

The Del Norte Communities

In the Smith River NRA, most of the population is located in the community of Crescent City, located on US Highway 101. Historic economic activities occurring in this area over the past 150 years include mining (e.g., gold and copper), homesteading and ranching, logging, commercial fishing and recreation-related tourism. The area provides diverse opportunities for outdoor enthusiasts and travelers, including fishing, hunting, hiking, rafting, and wildlife viewing. Currently, the main industries are services, recreation-related tourism, gaming, agriculture, forest products, local branches of federal, state, and county government agencies, and the Smith River and Elk Valley Rancherias and the Yurok Tribe's tribal governments.

The largest community in the area is Crescent City, with a 2012 population totaling 7,429. Crescent City has numerous small businesses, major bank branches, service businesses, forest products industry, and government agencies. As the largest community in the area, Crescent City serves as a regional trade and service center.

Smith River and Klamath are small communities located in Del Norte County on US Highway 101. Smith River is located 12 miles north of Crescent City with a 2010 population of 866. The Smith River Rancheria Tribal offices are located here. Klamath is situated at the mouth of the Klamath River, south of Crescent City. The population was 779 at the 2010 census. The Yurok Tribal offices are located in

Klamath. Key economic sectors include retail trade, tourism, recreation, gaming, agriculture, forestry, commercial and sport fishing, and hunting.

Gasquet and Hiouchi are small communities located in Del Norte County east of Crescent City on US Highway 199. The area population is approximately 900. Key economic sectors include tourism, recreation, retail trade, agriculture, forestry, fishing, hunting, and mining.

Four federally Recognized Indian Tribes are located in Del Norte County, the Smith River Rancheria, Elk Valley Rancheria, Resighini Rancheria and the Yurok Tribe. The Smith River Rancheria, located in the community of Smith River has an enrolled population of 1,008. The Elk Valley Rancheria has an enrolled population of 98. Both Rancherias have casinos and tourism related facilities. The Resighini Rancheria has an enrolled population of 111.

The Yurok Reservation with an enrolled population of 4,912 has tribal offices in Klamath and Weitchpec. Yurok Reservation lands currently extend from the mouth of the Klamath River for one mile on each side of the river for a distance of 44 miles upriver to the confluence with the Trinity River at Weitchpec. The majority of this land is now privately held in non-Indian ownership. All told, less than 5,000 acres of reservation land remain in trust status, as either tribal trust, village reserve, or trust allotments. The Tribe is in the process of acquiring approximately another 47,000 acres of ancestral lands from the Green Diamond Timber Company. The Yurok Tribe currently has a gas station and convenience store at Klamath and a hotel and casino that opened in 2014.

The community information comes in part from the *Del Norte County Economic Profile* (Center for Economic Development 2013), *Del Norte County Economic Profile*, *Economic Profile System – Human Dimensions Toolkit* (Crescent City CCD 2013), *American Indian Population and Labor Force Report* (BIA 2005), and *Yurok Forest History* (1994).

Population and Demographics

Population, age and racial distributions of counties are important socioeconomic consideration in land management planning. The following sections highlight demographic trends in the forest study area. Population forecasts provide a projection of future population levels, which may help to indicate the potential for increased pressures for uses and recreation opportunities on the SRNF. Age distributions provide insights into the socioeconomic dynamic in the local area in terms of assessing the proportion of individuals in the working age group versus retirees and minors who typically use local services in different ways. Similarly, the racial and ethnic composition of the local area may affect the cultural uses of public lands.

Population and Growth Trends

Del Norte County is currently home to over 25,000 people. Population (Table 3-102) increase has been steady for the last ten years, with an annual average increase of 126 people (0.5 percent). Between 2001 and 2011, population grew by 5.2 percent. In Del Norte County between 2000 and 2009, there tended to be more population change from net migration (596) than natural increase (488). However, during 2009, there was a net in-migration of only two people and a natural increase of 73 people in the county.

Table 3-102. Del Norte County population.[48]

Year	Del Norte County	1-Year Change	California 1-Year Change
2000	24,127	n/a	n/a
2001	24,110	-0.1%	1.6%
2002	24,257	0.6%	1.4%
2003	24,416	0.7%	1.3%
2004	24,686	1.1%	1.2%
2005	24,824	0.6%	0.8%
2006	24,837	0.1%	0.7%
2007	24,858	0.1%	0.8%
2008	25,092	0.9%	0.8%
2009	25,136	0.2%	0.7%
2010	25,211	0.3%	0.7%
2011	25,372	0.6%	0.8%

Race and Ethnicity

Approximately 70 percent of residents in Del Norte County classified themselves as White in 2010, compared to 40 percent of Californians. Hispanics represented the next largest group, with 19 percent of the population, compared to 38 percent in California. American Indians and African Americans were the next largest groups. Over the past ten years, the Asian population percent of increase has increased the fastest at 52 percent. The African American population percent of increase decreased the most at -17 percent. See Table 3-103 for the Del Norte County population by race/ethnicity compared to California as a whole.

Table 3-103. Del Norte County population by race/ethnicity compared to California.[49]

Race/Ethnicity	2000	2010	Percent of Total in 2010		2000 to 2010 10-Year Change	
			County	California	County	California
White	19,294	18,513	64.7%	40.1%	-4.0%	-5.4%
Hispanic or Latino	3,829	5,093	17.8%	37.6%	33.0%	27.8%
American Indian	1,593	1,935	6.8%	0.4%	21.5%	-9.3%
Black or African American	1,167	967	3.4%	5.8%	-17.1%	-0.8%
Asian	619	938	3.3%	12.8%	51.5%	30.9%
Native Hawaiian and Pacific Islander	18	26	0.1%	0.3%	44.4%	23.9%

Age Distribution of the Population

The county housed more people ages 55 to 74 in 2010 than in 2000. Some groups are growing faster than in the state, including small children under 5 and persons 55 to 74. The largest age group in Del Norte County in 2010 was the 40- to 54-year-old group, with 6,345 people. This number represents approximately 22.2 percent of Del Norte County’s population, which is 1 percent higher than the statewide average. Since 2000, the number of people between the ages of 55 and 64 increased 58.1

[48] Source: California Department of Finance, Demographic Research Unit.
[49] Source: US Census Bureau, Census 2000 and Census 2010.

percent, while those 25-39 decreased 7 percent. These trends may indicate that the number of jobs for those between the ages of 25 and 39 has declined, while people looking towards retirement are migrating into the area. Residents between the ages of 55-64 make up a higher percentage of the population in Del Norte County than the state average. See Table 3-104 and Table 3-105 for more details on age distribution in Del Norte County since 2000.

Table 3-104. Del Norte County population by age.[50]

Age Range	2000	2010
Under 5 years	1,525	1,703
5 to 17 years	5,371	4,435
18 to 24 years	2,196	2,519
25 to 39 years	6,471	6,018
40 to 54 years	6,145	6,345
55 to 64 years	2,351	3,717
65 to 74 years	1,850	2,153
75 to 84 years	1,223	1,263
85 years and over	375	457

Table 3-105. Del Norte County population by age compared to California.[51]

Age Range	Percent of Total in 2010		2000 to 2010 10-Year Change	
	County	California	County	California
Under 5 years	6.0%	6.8%	11.7%	1.8%
5 to 17 years	15.5%	18.2%	-17.4%	0.0%
18 to 24 years	8.8%	10.5%	14.7%	16.5%
25 to 39 years	21.0%	21.2%	-7.0%	-1.9%
40 to 54 years	22.2%	21.1%	3.3%	12.3%
55 to 64 years	13.0%	10.8%	58.1%	54.4%
65 to 74 years	7.5%	6.1%	16.4%	20.5%
75 to 84 years	4.4%	3.7%	3.3%	6.9%
85 years and over	1.6%	1.6%	21.9%	41.2%

The population and demographics information comes from the 2000-12 Del Norte County Economic and Demographic report.

Economic Overview

From 2000 to 2007, Del Norte County experienced steady economic growth. The recession of 2007 did impact Del Norte County but not as severely as it did the rest of California. The county experienced a rise in unemployment, a drop in income, and an increase in the poverty rate. Del Norte County is currently showing some signs of recovery.

[50] Source: US Census Bureau, Census 2000 and Census 2010.

[51] Source: US Census Bureau, Census 2000 and Census 2010.

Del Norte County’s available labor force grew steadily through 2009; then in 2010, the labor force plateaued. The county’s labor force shrank at a much faster rate than California’s after the recession. The county’s unemployment rate has also been considerably higher following the recession. Del Norte County’s labor force is influenced by seasonal employment with the largest labor force in the summer and fall. Government enterprises, health care, and social assistance are the industries, which employ the most people in the county. Government enterprises provide 34.9 percent, health care and social assistance 13.4 percent, and retail trade provides 11 percent of all jobs in the county. Small businesses make up the majority of businesses in the county. Establishments with one to four employees make up 58.7 percent of businesses.

Employment and Income

Forest land management activities affect the economic well-being of communities close to and within the forest boundaries. The forest zone of influence includes Del Norte County, in northwestern California. Del Norte County is predominantly rural and to some extent depends upon the forest’s natural resources—timber, fish, wildlife, recreation, air and water quality, visual quality, and biodiversity. Forest outputs provide raw materials for local industries and influence expenditures by the population.

Employment

There were approximately 9,316 people 16 years or older in civilian employment in Del Norte County in 2011. Of these jobs, 2,727 were in management, professional and related sectors. There were 2,817 jobs in the service sector and 2,232 in sales and office employment. Only 126 people were employed in farming, fishing, and forestry and 655 were employed in construction, extraction, maintenance and repair work. Employment in production, transportation, and material moving resulted in 759 jobs.

Service providing jobs account for approximately 30 percent of total employment. Employment within management, professional and related sectors was at approximately 29 percent. Sales and office employment was 24 percent of the total. Goods producing jobs, such as farming, forestry, and fishing, account for approximately 1.4 percent of total employment. Construction, extraction, maintenance and repair account for approximately 7 percent of total employment while production, transportation, and material moving account for approximately 8.1 percent of total employment. Government and government enterprises (federal, state, and local) account for 34.9 percent of total employment.

Unemployment rates within the county are typically higher than the average annual unemployment rates for California. Between 2000 and 2011, the average annual unemployment rate for California ranged from 4.9 percent to 12.4 percent. Unemployment rates during the period for Del Norte County; however, were consistently higher than the state, ranging from 5.7 percent to 14 percent.

Unemployment

Unemployment is the estimated number of people actively seeking work, not working at least one hour per week for pay and not self-employed. The data is estimated at the place of residence and reported by the California Employment Development Department (EDD) primarily from data collected by the US Current Population Survey (CPS).

Through the Current Population Survey, the government has a difficult time determining exactly how many people meet the technical definition of *unemployed* at the county level. That makes this indicator an inexact measure of the unemployed (Table 3-106).

Table 3-106. Total unemployment, Del Norte County.[52]

Year	County Unemployed	County Unemployment	State Unemployment	1-Year Change County	1-Year Change State
2000	760	5.7%	4.9%	n/a	n/a
2001	820	5.6%	5.4%	7.9%	11.9%
2002	900	6.4%	6.7%	9.8%	24.8%
2003	890	7.0%	6.8%	-1.1%	2.4%
2004	860	6.6%	6.2%	-3.4%	-8.5%
2005	800	6.2%	5.4%	-7.0%	-12.6%
2006	740	5.7%	4.9%	-7.5%	-9.2%
2007	830	6.1%	5.3%	12.2%	10.8%
2008	990	8.0%	7.2%	19.3%	36.4%
2009	1,410	12.4%	11.3%	42.4%	57.7%
2010	1,560	14.0%	12.4%	10.6%	9.6%
2011	1,530	13.3%	11.7%	-1.9%	-4.5%

Income

Personal income is income that is received by all persons from all sources including wages, salaries, proprietor’s income, rents, interest, and dividends. Personal income in 2010 within Del Norte County, adjusted for inflation, totaled approximately $784 million. Labor income, which includes wage and salary disbursements to employees and proprietors income, totaled approximately 65.6 percent of household earnings. Other sources of household income included Social Security, retirement income, Supplemental Security Income (SSI), cash public assistance, and Food Stamp/SNAP. Approximately 36.4 percent of household income came from Social Security, 24.5 percent came from retirement income, 12.1 percent came from SSI, 8.2 percent from cash public assistance, and 12.1 percent from Food Stamp/SNAP. See Table 3-107 for Del Norte County’s median household income.

Table 3-107. Del Norte County median household income (nominal).[53]

Year	Del Norte County	California
2000	$39,544	$46,836
2001	$38,607	$47,064
2002	$39,597	$47,323
2003	$40,368	$48,440
2004	$42,952	$49,894
2005	$45,454	$53,627
2006	$47,342	$56,646
2007	$48,144	$59,928

[52] Source: California Employment Development, Labor Market Information Division.

[53] Source: US Department of Commerce, US Census Bureau, Small Area Income and Poverty Estimates.

Year	Del Norte County	California
2008	$49,938	$61,017
2009	$48,444	$58,925
2010	$46,295	$57,664

Per capita income is one of the primary economic indicators of a community. Income influences buying power and affects local retail sales. The 2010 Del Norte County inflation adjusted per capita income was approximately $26,937 compared to California's per capita income of $42,514.

Median household income, the income midpoint, is the income level at which half of the area's households earn more and the other half earn less. The US Census Bureau annually estimates median household income for counties. When evaluating income growth among all economic classes Median household income is a better measure of average income than per capita income. Changes in per capita income can be driven by growth increases in the high-income ranges only. Growth in median household income usually indicates expansion across the full range of incomes. In 2010, Del Norte County's median household income was $46,295, while California's was $57,664.

Environmental Consequences

Lifestyles, Attitudes, Beliefs and Values

The forest held several workshops designed to help the public better understand the project, gather information, and learn how to provide input that could be used to help create alternatives to the proposed action. A mutual perspective was the desire to see the forest managed for motor vehicle use and ensure protection of the resources. During these workshops and from the scoping and comments on the DEIS on the proposed action and alternatives various perspectives came from how to manage for motorized use and to what degree. Comments ranged from designating all UARs to the system to providing maximum protection of resources.

Following are comments that reflect some of these perspectives:

- Driving is part of the recreational experience, which provides opportunities to enjoy the scenery and explore remote areas.
- Most people like to use the Forest with their families and friends. Here are examples of what was expressed, "I hope that the continued use of off road motor vehicles within… the Six Rivers will be considered and maintained… Our family is very involved in off road motorcycle riding and we certainly hope that there will continue to be access to our Six Rivers National Forest lands to enjoy off road motorcycle riding." "… We want our children and grandchildren to maintain our cultural traditions... access to the forests is extremely important to our way of life."
- They are concerned that eliminating trails will limit their areas of enjoyment.
- The value of most OHV enthusiasts is to have a continuity of trails. OHV enthusiasts want existing trail systems to continue and be enhanced. This is an example of what was expressed,

"trails are getting cut down to a point where there are no loops; meaning you have to drive back the same way you go in rather than loop around."

- They are concerned that seasonal closures will adversely impact the prime use recreation times.
- There was a trend among the motorcycles users desiring trails designated for single-track routes in order to increase their enjoyment of the experience.
- The trend among local residences is the desire to have trails they can ride near their home.
- Concern was raised from hunters that the quality of the experience would decline with the closure of trails.
- "We especially value and appreciate the roadless, salmon refuge, and botanical diversity qualities of the Smith R. NRA."
- We highly value the NRA's unique roadless and botanical areas and feel they warrant a high level of protection for present and future generations to enjoy.
- It is undisputed that the existing network of user created routes, in addition to a number of poorly-designed system roads, are a major cause of chronic sedimentation problems in streams, damage to rare and endemic plant populations, loss of roadless wildland recreational opportunities, and spread of Phytophthora lateralis.
- I object strongly to any further designation of ORV routes in the Smith NRA. ORVs are destructive to plants, reptiles, amphibians, and the peaceful enjoyment of nature by humans.
- There should be places in the Smith River National Recreation Area where hikers, anglers and other quiet recreationists can go to get away from the noise and pollution from dirt bikes, ATVs, and other off-road vehicles (ORV)… Please ensure that you take into consideration the experiences sought by…those of us who participate in quiet, nonmotorized forms of recreation, as you decide where ORVs can drive.

Parties with a variety of interests have a stake in this travel management plan. There are many cases of conflicting interests. Just as attitudes, beliefs and values differ across stakeholders, so do their uses of the forest and their desired direction for travel management. A common belief by those who favor motorized recreation was that motorized access would be greatly reduced. In contrast, for those who valued quiet recreation and reference landscapes, it is common belief that the proposed action greatly increased opportunities for motorized access. How an individual believes an action will affect something they value affects their attitude toward that action. Four common issues emerged through the travel management planning process on the Smith River NRA. These issues arose among public stakeholders because of how they believe this project will affect the values on national forest land they care deeply about.

One issue concerns the availability of motorized recreation opportunities. The concern is that removing NFTS roads and not designating all UARs for motorized travel would adversely affect the quality of motorized recreation opportunities. This is a shared concern among many OHV enthusiasts, who believe all NFTS roads should be kept open and additional motorized recreation opportunities should be developed. Specific activities of concern that were identified include dispersed camping, OHV use, big game retrieval, and non-motorized forms of recreation. Hunters could experience trouble retrieving downed big game if they were not allowed motorized access off designated roads and trails. This is of particular importance to the elderly and those with physical handicaps with limited ability to walk long distance to retrieve downed game. These user groups value motorized recreation opportunities on the forest, and any perceived loss of those opportunities would negatively impact their quality of life.

Another issue of concern identified is that the project will limit motorized access to dispersed recreation sites. The fear is that such restrictions in travel would limit access for activities such as dispersed camping, hunting, fishing, sightseeing, and other recreational opportunities. The loss of dispersed recreational opportunities would result in a loss of tradition for individuals and families who have accessed the same sites over many years.

Other segments of the public are concerned with the negative effects motorized activities have on non-motorized recreation. Noise pollution and visual impacts to landscapes are a concern for those who value quiet recreation, solitude, and viewing undisturbed landscapes. The creation of any additional motorized recreation is believed to be a threat to the recreational experiences and aesthetic values observed by visitors who enjoy quiet recreation.

Some people are concerned that maintaining existing NFTS roads, and, or designating roads and motorized trails will impact natural resources values. Resource damage such as sedimentation, erosion, spread of noxious weeds, impacts to botanical species, along with concerns about insufficient enforcement, monitoring and funding for maintenance of the NFTS are some of the key concerns identified by the public. It is believed that the addition of new motorized recreation opportunities or the maintenance of the existing NFTS would contribute to resource degradation, and in some instances, the loss of irreplaceable natural resource values.

These concerns reflect difference in the attitudes, beliefs and values among interested parties. Those characteristics shared among advocates of motorized recreation differ from those common to supporters of natural resource and environmental issues. While all parties value the forest and the recreational opportunities offered therein, there is a marked difference in how people believe those values will be protected depending on the type of recreation they prefer.

Compliance with the Forest Plan and Other Direction

Concerns have been raised about the impact of travel management on people with disabilities and the elderly. These groups are more dependent on motor vehicles to access and enjoy national forests. Many dispersed recreation and forest-product gathering sites are detached from NFTS roads and trails; it is not possible to develop a route system that would fulfill every stakeholders need. Permitted activities may be addressed under separate analyses.

Implementation of the Travel Management Rule, Subpart B is forest wide and applies to all forest users equally. There is no legal requirement to allow people with disabilities to use motor vehicles on roads, on trails, and in areas that are closed to motor vehicle use. Restrictions on motor vehicle use that are applied consistently to everyone are not discriminatory. Generally, granting an exemption from designations for people with disabilities would not be consistent with the resource protection and other management objectives of travel management and would fundamentally alter the nature of the Forest Service travel management program (29 USC 794; 7 CFR 15e.103).

Under §504 of the Rehabilitation Act of 1973, no person with a disability can be denied participation in a federal program that is available to all other people solely because of his or her disability. Consistent with 36 CFR 212.1, FSM 2353.05, and Title V, §507(c), of the Americans With Disabilities Act, wheelchairs and mobility devices, including those that are battery-powered, that are designed solely for use by a mobility-impaired person for locomotion and that are suitable for use in an indoor pedestrian area, are allowed on all NFS lands that are open to foot travel.

Environmental Justice

Environmental justice speaks to concerns that costs of federal decisions could fall disproportionately on people of a particular ethnic or cultural heritage group, or on people with low incomes. Environmental Justice is an executive order (EO 12898) that requires, in brief, that each federal Agency shall make achieving environmental justice part of its mission by identifying and addressing, as appropriate, disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on minority populations and low-income populations.

The Council on Environmental Quality (CEQ) (1997) provides the following definitions in order to provide guidance for compliance with environmental justice requirements in NEPA:

> *… Minority populations should be identified where either: (a) the minority population of the affected area exceeds 50 percent or (b) the minority population percentage of the affected area is meaningfully greater than the minority population percentage in the general population or other appropriate unit of geographic analysis…*
>
> *… Low-income populations in an affected area should be identified with the annual statistical poverty thresholds from the Bureau of the Census' Current Population Reports, Series P-60 on Income and Poverty. In identifying low-income populations, agencies may consider as a community either a group of individuals living in geographic proximity to one another, or a set of individuals (such as migrant workers or Native Americans), where either type of group experiences common conditions of environmental exposure or effect.*

Potentially affected tribes have been consulted and effects have been considered on their rights and concerns within the analysis of alternatives. American Indian populations will not be disproportionately impacted under any alternative with avoidance of heritages resources, consideration of traditional values, and reasonable access allowed through agreements, permits and recognition of their sovereignty and legal rights. None of the alternatives would have a disproportionate economic impact on any minority or low-income community as the motorized use decisions are spread through the project area and do not cause any adverse effect on any particular minority population. Non-motorized access may be a burden to some individuals, particular those with mobility related disabilities, young children, or heavy objects that would be difficult to transport.

The forest held several workshops designed to help the public better understand the project, gather information, and learn how to provide input that could be used to help create alternatives to the proposed action. These meetings were well attended by stakeholders with a variety of interests. All people were encouraged to provide comments.

At this time, no evidence suggests that actions being considered have disproportionately high and adverse impact on minority and low-income populations.

Soils

Introduction

The soil resource provides many essential functions for NFS lands. It sustains plant growth that provides forage, fiber, wildlife habitat, and watershed protection. It absorbs precipitation, stores water for plant growth, and gradually releases surplus water, which attenuates runoff rates. It sustains microorganisms that recycle nutrients for continued plant growth. The NFMA and other acts recognized the fundamental need to protect, and where appropriate improve, the quality of soil. Management activities on NFS lands must be planned and implemented to protect the soil resources; most important is retention of productivity in the long term.

Soil productivity on the forest has been directly impacted by the type, extent, and location of designated NFTS roads, motorized trails, and UARs). These UARs generally developed without environmental analysis or public involvement, do not have the same status as NFTS roads and motorized trails, and often do not meet Forest Plan standards and guidelines and BMPs. As a result, negative effects to soils and other watershed resources that are important to ecosystem function have occurred in some locations.

Direct impacts to soils and adjacent watersheds that result from this project are limited. There are no new ground disturbing activities proposed with this project outside of the existing UAR or road prisms. The UARs and existing NFTS roads being evaluated in this analysis already exist on the ground. Most routes evaluated for designation on the NFTS are in need of mitigations to bring them up to NFTS standards. They are compacted and generally lack vegetation. Runoff from the surface is collected and discharge as potentially erosive flows at points below the road. Some are eroded or resulting in off-site erosion, while others are stable and are not causing any negative resource impacts.

From the standpoint of soil productivity and growing vegetation, these routes are already non-productive and the direct effects to soil productivity have already occurred. Therefore, on these UARs, the potential effects on soil and watershed resource are related to sustaining the motorized trail function, protecting adjacent soils from runoff and gully erosion, protection or improvement of water quality, or restoring drainage patterns. It should be noted that numerous roads and motorized trails within the Smith River NRA travel management area have some site specific risk to soil and water resources, and that these risks can be reduced to acceptable levels through decommissioning, upgrading, downgrading, restoring drainage patterns, stormproofing and barricading.

Discouraging motorized use on native surface trails may result in less erosion to the extent the recurrent disturbance of the soil surface by users is the primary cause of erosion. In many circumstances however, erosion and subsequent sediment delivery to water bodies is the result of a combination of factors including motorized use, season of use, a lack of drainage and maintenance, and poor trail design or location.

The primary concern or effect of this project on soil resources are indirect effects associated with the potential for soil erosion and subsequent effects on off-trail soil productivity, or the ability of the soils to produce vegetation. Indirect effects from erosion are the loss of soil depth, infiltration capacity and permeability. In other words, a reduction in soil hydrologic function, which can in turn affect aquatic resources (see *Water Quality* section). Because this analysis addresses existing wheel tracks, the direct impacts to soil productivity, hydrologic function and soil buffering capacity have already taken place, however actions to recover soil productivity such as decommissioning roads and restoring UARs would result in direct positive effects to soil productivity on where there is currently an existing road or UAR.

The erosion that may occur on UARs proposed for designation to the NFTS is a concern regarding loss or degradation of the facility, but is not a particular concern for the soil resource, because the roads and motorized trails are dedicated to the NFTS and are no longer dedicated to growing vegetation. The effects analysis for the soil resource would therefore focus on the indirect effect, risk of soil erosion from trail runoff water to the adjacent down slope soil. Erosion and sediment generated by the motorized trail or road surface may be a concern to water quality if there is the potential for its delivery to a stream course (see *Water Quality* section).

This section describes the effects to the soil resource within the Smith River NRA of designating UARs to the current NFTS for public motor-vehicle use. Other aspects of the proposed action will also be analyzed including changes to the NFTS, upgrading or downgrading maintenance levels on existing NFTS roads; decommissioning of roads; and restoring drainage patterns on UARs not designated to the NFTS, and the effects of resource risk mitigations.

Analysis Framework: Statute, Regulation, Forest Plan, and Other Direction

Direction relevant to the proposed action as it affects the soil resource includes:

National Forest Management Act of 1976 (NFMA) and Forest and Rangeland Renewable Resources Planning Act of 1974 (RPA)

"…recognize the fundamental need to protect and where appropriate, improve the quality of soil, water, and air resources."

National Soil Management Handbook

This national soils handbook (USDA 1991) defines soil productivity and components of soil productivity, establishes guidance for measuring soil productivity, and establishes thresholds to assist in forest planning.

Region 5 Soil Management Handbook Supplement

This handbook supplement (R5 FSH Supplement 2509.18-95-1) establishes regional soil quality analysis standards. The analysis standards address three basic elements for the Soil Resource: 1) soil productivity (including soil loss, porosity, and organic matter), 2) soil hydrologic function, and 3) soil buffering capacity. The analysis standards are to be used for areas dedicated to growing vegetation. They are not applied to lands with other dedicated uses, such as developed campgrounds, administrative facilities or, in this case, the actual land surface authorized for travel by the public using various kinds of vehicles. Drainage structure, function, and spacing are key to minimizing the amount of surface flow, which directly affects surface erosion from roads. The Water Conservation Practices Handbook (FSH 2509.25) provides guidelines for drainage structure spacing.

Regional Forester's Letter

This letter (Feb 5, 2007) provides clarification to forest supervisors on the appropriate use of the R5 Soil Management Handbook Supplement (R5 FSH Supplement 2509.18-95-1). It states in part:

> *Analysis or evaluation of soil condition is the intended use of the thresholds and indicators in R5 FSH Supplement 2509.18-95-1. They are not a set of mandatory standards or requirements. They should not be referred to as binding or mandatory requirements in NEPA documents. Standards and guidelines in forest plans provide the relevant substantive standards to comply with NFMA.*
>
> *The thresholds and indicators represent desired conditions for the soil resource. Utilization of these and their indicators provides a consistent method to analyze, describe, and report on soil condition throughout the Region.*

Smith River National Recreation Area (NRA) Management Plan

This plan (November 1990) describes specific management direction applicable to each of the eight management areas, many of which relate to the proposed action, including "…improve the anadromous fishery and water quality, including (but not limited to), stabilizing landslides, improving fish spawning and rearing habitat, and placing appropriate restrictions or limitations on soil-disturbing activities."

The Travel Management Rule (36CFR 212, 251, 261, and 295)

The Travel Management Rule (November 2005) makes a key clarification of the Executive Order in this section. The Executive Order says "areas and trails shall be located to minimize" damage to soils, harassment of wildlife, conflicts between motor vehicle use and existing or proposed recreational uses, etc.

1995 Six Rivers National Forest Land and Resource Management Plan (Forest Plan)

The Forest Plan established standards and guidelines on pages IV-70 and 71 (USDA 1995). The analysis standards are to be used for areas dedicated to growing vegetation. They are not to be applied to lands with other dedicated uses, such as developed campgrounds, administrative facilities or in this case, the actual land surface authorized for travel by the public using various kinds of vehicles. Forest plan direction, standards, and guidelines are designed to prevent significant or permanent impairment of soil productivity and related watershed resources for management areas that include:

Soils and Geology

Goals

- The primary management goal is maintenance of long-term soil productivity and high water quality.

- Plan and conduct all forest management activities to maintain existing water quality or, where degraded, restore water quality to meet state water quality standards for the North Coast Region.
- Maintain the integrity of watersheds and riparian ecosystems, including riparian zones, for the protection or enhancement of riparian-dependent resources.

Direction

- Manage soil and water resources to protect and enhance long-term productivity of the forest, water quality, associated beneficial uses, and aquatic ecosystems.
- Program emphasis is to avoid or mitigate the impacts of management activities on slope instability, water quality and soil productivity.
- Identify watershed improvement needs to be included on the forest's Watershed Improvement Needs Inventory. Prioritize projects based on severity, needs, effects on beneficial uses, and potential for recovery.
- Design all resource management activities to meet state water quality criteria. Best management practices will be applied in planning, implementation and maintenance of all forest activities as means to achieve water quality standards. Proper installation, operation and maintenance of State approved BMPs are presumed to meet the manager's obligation for compliance with applicable water quality standards as well as compliance with the Clean Water Act (EPA, Water Quality Standards Handbook, Chapter 2 1987/ MAA with SWRCB 1981).
- Assessments of the cumulative effects of project level activities on soil and water resources will be provided during project analysis at whatever level of analysis is necessary (site, watershed, or basin).

Soil Productivity

Standard and guideline 1-1 and 1-3 generally relate to soil productivity in forest and range production areas. They do not apply to lands dedicated to other uses, such as administrative sites or NFTS roads and trails. They identify points at which further alteration of soil properties could result in significant change or impairment in the productive capacity of the soil, and techniques to maintain soil productivity:

- **1-1:** Implement forest soil quality standards as described in Appendix L, that includes:
    - Soil porosity is at least 90 percent of its natural conditions.
    - Organic matter is present in sufficient amounts to prevent significant short or long-term nutrient cycle deficits, and to help avoid adverse physical soil characteristics (The organic matter in the upper 12 inches of soil should be at least 85 percent of its natural conditions.
    - Litter and duff occurs over at least 50 percent of activity area.
    - Large woody material when occurring in forest areas is at least five logs per acre in contact with the soil surface.
- **1-3:** Where soils are susceptible to compaction, actions will be required to mitigate or avoid compactions.

Soil Erosion and Mass Movement (standards and guidelines)

- **1-6:** The potential for increased mass movement and soil erosion will be addressed for proposed timber harvest and road building. Landslide hazard maps and a risk assessment should be developed for timber harvest planning. Alternate road specifications or road locations should be evaluated where proposed management would increase the potential for mass movement and soil erosion.
- **1-7:** Roads, landings, and timber harvest units will be located and designed to avoid triggering or accelerating mass movements that would adversely affect a stream or degrade a commercial timber-growing site by removing a substantial volume of topsoil.
- Maintain soil productivity by applying guidelines to areas where management prescriptions are applied.
- Design management activities not to exceed an R5 Erosion Hazard Rating of moderate.
- Alternative road/routes should be evaluated where proposed management would increase the potential for mass movement and soil erosion.
- Where applicable and practical, restore the productive capacity of soils damaged by past events.

USDA National Best Management Practices Motorized and Non-motorized Trails (Rec-4)

Objective: Avoid, minimize, or mitigate adverse effects to soil, water quality, and riparian resources by controlling soil erosion, erosion of trail surface materials, and water quality problems originating from construction, maintenance, and use of motorized and non-motorized trails.

Explanation: The Travel Management Rule restricts motor vehicle use to designated routes to better manage motor vehicle use and protect national forest resources.

Applicable Practices

- Use suitable public relations, information tools, and enforcement measures to encourage the public to conduct motorized vehicle use activities within designated areas in a manner that will avoid, minimize, or mitigate adverse effects to soil, water quality, and riparian resources.
- Locate and maintain designated motor vehicle use to minimize adverse effects to soil, water quality, and riparian resources.
- Designate season of use periods to avoid adverse impacts to soils.
- Designate class of vehicle suitable for soil and terrain, or to protect national forest resources.
- Place restrictions on motor vehicle use off designated routes for dispersed camping to minimize or mitigate adverse effects to soil, water quality, and riparian resources.

If considerable adverse effects are occurring, or are likely to occur, immediate corrective action will be taken. Corrective actions may include, but are not limited to, reduction in the amount of motorized trail use, signing, or barriers to redistribute use, partial closure of areas, rotation of use on areas, closure to causative vehicle type(s), or total closure, and structural solutions, such as culverts and bridges. Closure is accomplished through authority of the forest supervisor.

Affected Environment

Soils within the *Smith River National Recreation Area Restoration and Motorized Travel Management* project area are underlain dominantly by rocks of the Western Klamath terrane of the Klamath Mountains Geologic Province. The principal components of this accreted terrane in the project area include the Galice formation and the Josephine Ophiolite. The Galice formation is comprised of marine slate, meta-graywacke sandstones, and other sedimentary rocks metamorphosed to the green-schist facies. The Josephine Ophiolite consists of a suite of mostly ultramafic rock types, principally peridotite, that represent a largely intact sequence of ancient mantle and oceanic crust. Older rocks of the Rattlesnake Creek terrane, a highly disrupted mélange terrane composed of metavolcanics, serpentine and mafic dikes, crop out along the eastern margin of the project area. Plutonic rocks, including the ultramafic Lower Coon Mountain pluton, make up the remainder of the bedrock in the area.

Dominant parent materials of the soils (SRNF Soil Survey 1993) in the analysis area are metasedimentary rock (29.3 percent), serpentinized peridotite (27.5 percent), and meta-igneous rock (20 percent). Serpentinite rock associated with faults and shear zones comprise 7.6 percent. These percentages are based on attributes found in the spatial layer of the soil survey, and may differ from those described in the *Geology* section in this chapter. Due to the complex geology of the Klamath Mountains province, soils also vary widely across the landscape, and are dominantly of mixed mineralogy. In general, most soils are shallow, medium textured, and contain high percentages of rock fragments. Very deep soils also occur but are usually limited to ancient mass wasted land surfaces, glacial deposits or toe slope positions. Soils of particular interest are those derived from peridotite and serpentinite parent material because of their unique characteristics. Serpentine soils have low amounts of calcium and high amounts of magnesium, relatively heavy concentrations of nickel, chromium, and other heavy metals, and low levels of nitrogen and poor nitrogen uptake. They support very unique ecosystems that have evolved to tolerate and thrive in these soil conditions. More discussion on serpentine soils is found in the *Geology* section in this chapter.

The most common soils are classified in the Great Groups Xerochrepts and Haploxeralfs. The major difference between these two groups is a greater clay composition in the subsoil of Haploxeralfs. Common soil properties include gravelly loam and clay loam textures, very good drainage, moderate to moderately slow surface water permeability, and very low to moderate water holding capacity (high in a very few soils with very high clay content). Slope gradient, along with ground cover, are the most important factors determining the potential for soil erosion. Most of the soils located under the forest canopy have an organic layer of decomposing needle duff, from 0.5 to 3.0 inches thick.

Bedrock type and slope gradients have strongly influenced soil development and depth. The soils range in depth from shallow (less than 20 inches) to very deep (greater than 60 inches) throughout the area and soils of different depths are often associated, although the majority of soils are moderately deep (20 to 40 inches) to deep (40 to 60 inches). Elevations range from 160 to 6,240 feet. Slope ranges from 5 to 35 percent on the broad ridges to 35 to 90 percent on sideslopes with all aspects. Landscapes can be characterized predominantly as mountain sideslopes with numerous broad ridges.

Generally, the northern and western part of the Smith River NRA has much steeper terrain than the eastern and southern sides, leading to more miles of routes with higher erosion hazard ratings. Soil-erosion hazard rating is high in 46 percent of the mapped soils in the planning area, moderate in 49 percent, and low in 5 percent of the soils. On disturbed soils, runoff potential is low to moderate, depending on the steepness of slope. Susceptibility to soil compaction for the majority (75 percent) of the soils in the analysis area is moderate, while high comprises about 23 percent and low is about 2 percent. The dominate soil types and common soil families of Smith River NRA include Jayel, Clallam, Gasquet, Kistirin, Goldridge, and Oragran.

Soil Risks Related to Roads and Motorized Trails

Roads are considered the principal cause of accelerated erosion in forests throughout the western United States (Reid and Dunne 1984, Furniss and others 1991, Grace and Clinton, 2007, Trombulak, and Frissell. 2000). Roads change soil density, temperature, soil water content, light levels, dust, surface waters, patterns of runoff, and sedimentation, as well as adding heavy metals (especially lead), salts, organic molecules, ozone, and nutrients to roadside environments (Trombulak and Frissell 2000). The use of roads, trails and other areas on national forest for public operation of motor vehicles also has potential to affect the soil resource through interception of runoff, compaction of soils, and detachment of sediment (Foltz, 2006). The locations of roads determine the degree of potential impacts, making some roads more environmentally sensitive than others. The presence of roads can increase the frequency of slope failures compared with the rate for undisturbed forest by hundreds of times (Furniss and others 1991). A single, poorly designed road or motorized trail on a highly erosive soil could cause unacceptable soil loss, but result in no impact to water quality if not delivered to a stream. A very high density of roads and, or motorized trails on a moderately erosive soil in an area with a high stream density could be unacceptable for water quality (the likelihood of delivery is high), but not necessarily a major impact to the soil resource.

Past human activity in the Smith River NRA has resulted in the creation of roads and UARs where soil compaction, displacement (removal of topsoil), and erosion have altered soil productivity. Effectively, road construction is a long-term commitment of the soil to use as a road. Returning soil to its original productivity after use as a road is a chemical, physical, biologic, and geologic process that can take hundreds of years. Soil productivity begins to return after road closure to vehicle travel, allowing the vegetation recovery process to begin, often within one year in the Smith River NRA.

Soils that were once porous and easily penetrated by water are now more susceptible to overland flow and surface erosion. Where topsoil has been removed or excessively compacted, minimal vegetation would grow, perhaps some grasses, forbs, and perhaps invasive species exist. Froehlich et al. (1985) and Wert and Thomas (1981) found slow rates of natural recovery of compacted soil restricted primarily in the top 6 inches. Wert and Thomas (1981) observed that heavy compaction persisted at the 8- and 10-inch depths.

Bulk density of the soil is often used to characterize compaction. Froelich (1976) has reported that most productive soils in the Pacific Northwest are characterized by relatively low bulk densities, ranging from about 0.5 g/cm^3 to 0.9 g/cm^3, and as a result have high macroporosity, high infiltration rates, and low soil strength. Heilman (1981) found that the roots of Douglas-fir seedlings could no longer penetrate soil at about 1.8 g/cm^3. For reference a road surface with igneous rock and then heavily compacted would exceed 2.0 g/cm^3. Pure igneous rock would be about 2.65 g/cm^3.

Soil drainage is not a concern on the majority of soils within the Smith River NRA project area, as nearly all of the soils are well drained. Erosion is greatest where runoff is concentrated and runoff dispersion features (i.e. waterbars) are lacking. Most erosion problems observed were on the steeper portions of routes (generally over 35 percent slopes) where surfaces have been compacted due to motorized use.

There are two types of soil loss on roads and motorized trails. First is the loss of soil from the tread itself. Because the road or trail surface is a dedicated use of the land, this is not so much a soil productivity issue as it is a loss of facility function. Loss of soil productivity occurred when the road or trail was constructed as part of the transportation system. In the case of UARs, the loss of soil productivity occurred as the route became more compacted and established over time.

The second type of erosion is the loss of soil that occurs when concentrated water from the road or motorized trail surface creates a gully or other erosion features down slope. When culverts plug and are over-topped, the water may run across the road and into the same drainage or may run down the road for some distance, leaving the road in another drainage. Where water is diverted into another drainage, it adds to the flow volume in that drainage, and can cause long-term gully erosion (Furniss et al, 1997). The ability of the water to run down the road to a different drainage is termed diversion potential. This reduces soil productivity, vegetative growth and water quality when sediment is delivered to a watercourse. Concentrated runoff is the primary agent of erosion on native surfaced roads, motorized trails, and UARs. Mechanical displacement of soil by traffic is also important, although most mechanically displaced soil is ultimately transported by concentrated runoff. Mechanical displacement is impacted more as road or trail gradients become steeper. The *Water Quality* section in this chapter provides additional information regarding erosion and sedimentation effects on water quality for the analysis area.

Unauthorized Routes (UARs)

Much of the Smith River NRA travel-management analysis area is too steep for OHV use. About 234,000 acres are lands with less than 35 percent slopes where use of off-road vehicles is practicable. Off-road vehicle use can result in soil displacement and compaction on any of these acres. The forest recognizes that there may be some unintended illegal use occurring on UARs due to poor signage and lack of barriers to prevent motorized use.

Unauthorized routes mapped in the project area are a combination of abandoned Forest Service roads, which were primarily intended for temporary use related to timber harvesting, fire suppression activities, exploratory mining routes and user-created routes. Most of these UARs are native (bare soil) surfaced travelways, many of which are in need of erosion control drainage structures, especially those with steeper grades and located on erosive soils.

The total miles of all inventoried UARs within the Smith River NRA is about 155 miles. These are the total miles, which differs from the UAR mileage analyzed in the action alternatives that are to be added to the NFTS. Of the 155 total miles, about 63 percent are in the high average erosion hazard-rating category (Table 3-108).

Table 3-108. Miles[54] of existing UARs in each R-5 average erosion hazard rating.

Alternative	Erosion Hazard Rating			No map coverage	Totals
	Low	Moderate	High		
1	5.5	50.9	96.7	1.7	154.8

There are about 59 sites located on 36 miles (23 percent) of the inventoried UARs that have notable erosion features (e.g., rilling or rutting). The majority of the UARs have native (unsurfaced) road prisms that are potentially susceptible to tread wear and erosion.

Most of the routes considered in this analysis are not engineered roads; that is, they have not been designed but have been created through repeated vehicle travel on relatively gentle slopes. Site visits have confirmed that most have been hardened through use, and running surfaces are generally stable and self-maintaining. Much of the mileage proposed for addition to the NFTS consists of relatively short, rough-surfaced routes that access dispersed recreation sites. Routes proposed for designation as ML 1, 2 and 3 roads or trails would require improvements to meet Road Management Objectives before they are designated to the system.

Effects Analysis Methodology

This section describes the methodology and assumptions used for the effects analysis of the alternatives. Impacts relevant to soils, resource specific assumptions, soil indicators, sources of information, timeframes (both short and long-term), and spatial boundary of the effects analysis are addressed. The effects analysis will focus on the methodology and indicators for addressing the direct, indirect and cumulative effects of implementing each of the alternatives, and includes the effects of ongoing and reasonably foreseeable actions.

Assumptions Specific to the Soil Resource Analysis

For every scientific analysis, it is necessary to make some assumptions. For the soil resource analysis, the assumptions made are necessary because: 1) there is much variability in soils, terrain and geologic conditions on the ground: 2) all of the UARs already exist: and 3) the project area is large.

See the introduction at the beginning of this chapter for a list of common assumptions and limitations. The soil effects analysis assumptions are common to each of the four types of actions within each alternative.

- Where necessary, routes that are designated to the NFTS roads and motorized trails would receive mitigations (i.e. waterbars) prior to allowed use. Implementation of mitigation measures is expected to lower higher risk routes to moderate or low risk, by addressing surface runoff, minimizing offsite movement of soil, and preventing degradation of the running surfaces.
- While there are existing impacts from UARs, this analysis treats all routes as though there are varying levels of current unintended illegal use.

[54] All values are miles. Some miles do not have soil map coverage and therefore no assigned erosion hazard rating.

- Soil productivity is considered lost on UARs when ongoing vehicle use is similar to current level of use, and therefore the extent and degree of detrimental soil condition remains, mainly due to compaction that inhibits the growth of vegetation.
- The UARs being evaluated already exist. They are compacted and generally lack vegetation, and some are eroded. From the standpoint of soil productivity, these routes are already non-productive. Therefore, the potential effects on soils are only related to sustaining route function, protecting adjacent soils from runoff, gully and rill erosion, and indirect impacts to water quality, aquatic habitat conditions, and other watershed functions.
- Surface erosion is highly dependent on soils, road surfacing, and road grade and cross slope, age of the road, traffic volumes, and the effectiveness and spacing of drainage structures. The greatest surface erosion problems generally occur in highly erodible terrain, particularly landscapes with high erosion hazard ratings.
- Adverse effects of unauthorized use by vehicles include long-term damage to soil resources due to soil erosion, compaction, alteration of drainage patterns, and indirect effects to water resources. Without restoration, these effects would persist for years or decades following any prohibition of motor vehicle use.
- All NFTS roads and motorized trails would receive maintenance that would adequately prevent water from concentrating on the route surface. Motorized trails maintenance is largely focused on keeping waterbars effective. Road maintenance is important to protect the roads cross slope and drainage features. Road maintenance, especially on roads with cuts and fills, can reduce soil erosion and indirect sedimentation. Maintenance activities (such as cleaning culverts and ditches) maintain drainage, keep water off road surfaces, and reduce the potential for failures of culvert fills. Without sufficient maintenance, road surfaces may develop ruts that drain runoff down the road instead of off to the side. Lack of maintenance also leads to plugging of culverts, ditchlines with sediment or vegetative debris, leading to washouts.
- The type of route affects the potential for passive recovery (e.g., no active restoration measures implemented). Forest Service temporary roads used as UARs would recover very slowly (25 to 30 years). Most fill slopes and cut slopes would re-vegetate in time, but compacted road prisms recover very slowly (decades) unless the surface is mechanically ripped.
- User-created trails have the potential to recover faster, because these trails are narrower than a constructed road, the compaction is not as deep, and the soils profiles have not been disturbed. Recovery of user created trails is quite variable and mostly depends on slope gradients. Generally, all UARs and user-created trails can be assumed to be compacted to the point where natural recovery would take decades. However, actively eroding user-created trails would continue to erode without adequate drainage. User created trails that occur on shallow soils and/or lack forest or brush cover would recover very slowly.

- Most of the UARs considered in this analysis were established through repeated use by motor vehicles and do not have cuts and fills.
- Soil erosion and hillslope hydrology altered due to re-routing of water by the existing road prism would be corrected when: a) existing UARs that are not designated on the NFTS are restored to natural drainage patterns; b) designated routes with altered hydrology are improved to route water more naturally; or c) NFTS roads with drainage problems are stormproofed.
- The potential for sedimentation reaching a stream is dependent on a site's connectivity to a stream channel (see the *Water Quality* section on discussion of sediment impacts). While some UARs have evident gullying problems, others are stable or show no signs of surface damage. Routes with erosion concerns are identified, and mitigations would be implemented to reduce or eliminate the potential for sedimentation.
- By definition, NFTS roads, motorized trails and other areas not dedicated to growing vegetation are not considered activity areas to which the forest and regional soil standards should be applied. Therefore, any route or area brought into the NFTS by any alternative considered in this plan is not subject to standards of soil productivity.
- Effects of compaction on soil productivity are calculated on a management unit basis (Soil Quality Standards require that 15 percent or less of a unit be subjected to compaction resulting in detrimental impacts to soils). Application of this standard across the entire Smith River NRA would not provide a meaningful result. Therefore, effects on soil productivity are presented as the number of acres (by alternative) where soil productivity would be foregone, or improved, in the long term due to designations or decommissioning. For analysis purposes, each mile of route is assumed to equal 2 acres of ground where roadless characteristics (effects on soil or vegetation) are foregone.
- Where vehicle use of a route is discontinued and restored through active restoration, existing erosion features (rills, gullies) would be remedied and thereby a reduction in further erosion, loss of soil productivity, and sedimentation would occur in the future.
- Short-term effects on the soil resource would continue after UAR closures (barricades) are in place. Over the long term (25 to 30 years), where vehicle use of a route is discontinued, soils can regain productivity through natural recovery of soil porosity lost to compaction, and eventually vegetative recovery. This is referred to as passive soil recovery or passive restoration. Routes with fixed barriers are closed and are expected to re-vegetate. The effects analysis assumes re-vegetation over time. Differences in timeframe and ultimate composition of that re-vegetation may vary based on soil types and site conditions (aspect, rainfall, elevation, etc.). This assumption is based on on-the-ground observations of recovery of closed roads on the Smith River NRA by current and preceding watershed specialists. The climate, soils and other factors promote relatively rapid growth and establishment of vegetation.
- There is no difference in effects to soils from different types of vehicles using existing NFTS roads (mixed use).

- There is no difference in effects to soils of conversion of roads to motorized trails.
- The motorized trails proposed for designation, over 50 inches, would accommodate 4x4 jeeps. The effects analysis accounts for use allowable on motorized trails of this class size.
- The majority of the motorized trails are open year-round. Soil erosion concerns are addressed by stormproofing (improving drainage) and maintenance of the roads.
- Recovery times for routes in soil types with high erosion hazard ratings are variable (depending on rainfall, soil type and level of compaction) but would generally be longer for routes in moderate erosion hazard ratings or with moderate to heavy soil compaction (25 to 30 years).
- The timeframes for this analysis are based on measurable changes in vegetation recovery and improved soil productivity. A short-term timeframe of 1 to 5 years is defined, based on the amount of time it typically takes for vegetation to become reestablished after a disturbance has been discontinued. At 5 years, the root support from the vegetation begins to stabilize the ground and soil productivity improves. A long-term timeframe of 25 to 30 years is defined, based on revegetation by larger trees, which provide for improved decompaction of surface soils, infiltration and permeability, canopy cover, organic matter, and nutrient cycling.
- Routes that have a high erosion hazard rating would provide the greatest long-term benefits through restoration actions by reducing erosion that result in off-site impacts.

Data Sources

Smith River NRA Road Assessment and Restoration Planning

All routes included in the proposed action were investigated on the ground by qualified Forest Service and private contractor earth scientists. Based on an assessment conducted using GIS data, a subset of UARs located in areas sensitive to watershed resources (riparian areas) and providing the greatest risk to soil and watershed resources (e.g., proximity to stream channels, slope steepness, length of route) were inventoried. A combination of field data that identified erosion and slope on individual routes was evaluated against the average erosion hazard ratings and types of travel way (UAR, road, or motorized trail). Field review of routes documented the number and condition of road stream crossings, existing road-related erosion, delivery potential and hydrologic connection to stream channels.

GIS Analysis

The NFTS road, motorized trails and inventoried UARs were analyzed with respect to soil productivity and risk to soil erosion. These results were used to compare the proposed activities under each alternative with the selected soil indicators. Soil productivity is affected by soil type, cover, compaction, and displacement (erosion). Soil characteristics of texture, slope, and hydrologic conductivity are grouped by the soil survey (USDA Forest Service 1993). The inventory classifies forest soils into erosion hazard rating (EHR) categories of low, moderate, and high. Combinations of steep slopes, non-cohesiveness, and coarse texture (which promote erosion and degrade water-holding capacity for plants) add to higher erosion hazard ratings and make recovery of productivity in the long term problematic. A classification of high indicates that these soils, once de-vegetated, would not recover quickly. While high ratings can provide a relative gauge of the potential for soil displacement (movement of soil off the site, which can end up as sediment in a stream), they are not indicative of soil movement or sedimentation issues on any specific route. They are a better guide for whether the route would recover soil productivity within the foreseeable future.

The assumption was made that analyzed routes in a high erosion hazard rating would provide the greatest long term benefits to reducing erosion and result in off-site impacts. This assumption was corroborated by field data showing that soil erosion is closely related to steep slopes and high erosion hazard ratings. See the Travel Analysis Process 2005 (TAP) Report for additional information on criteria used for NFTS roads proposed for decommissioning. Miles of routes by erosion hazard rating were calculated through GIS using the forest's soil survey data (USDA Forest Service 1993).

It should be noted that the road and route miles displayed throughout the *Soils* section in this chapter are slightly different from what is shown as totals in Chapter 2. This is attributed to the road and route miles that the project is based on were calculated on-the-ground using beginning and ending mileposts. These miles are consistently different from GIS-calculated miles, when specific layers such as the soils EHR that was used for much of this analysis, is used and totals need to be re-calculated. The GIS-calculated miles were consistently used, and totals were found to be slightly less by a few miles. For this analysis however, they were determined to be suitable for comparative purposes between alternatives. Figures used were calculated on the ground using the beginning and ending milepost for each road or route.

Indicators, Timeframes, Spatial Boundary and Methodology and Assumptions

The following will be used to compare the differences in soil effects between alternatives:

1. Direct and indirect effects of designation of facilities on the NFTS

Short-term timeframe: 1 year.

Long-term timeframe: 25 to 30 years.

Spatial boundary: Smith River NRA and Gasquet Ranger District boundaries.

Indicators: 1) Miles of UARs designated to the NFTS by Region 5 average erosion hazard rating (low, moderate, and high); and 2) miles of UARs to be designated that have existing surface erosion features that have been inventoried that are a priority for rehabilitation treatments.

Methodology and Assumptions: GIS analysis of route and erosion hazard ratings; miles of UARs with inventoried erosion sites. All routes included in the proposed action were investigated on the ground by qualified earth scientists. Field review of routes documented existing road-related erosion, delivery potential and hydrologic connection to stream channels. The assumption was made that routes in the high erosion hazard risk rating would continue to have the potential to erode and result in on- and off-site impacts until routes were designated and had maintenance and restorative treatments applied.

Rationale: Published studies (see *Affected Environment and Reference* sections) have documented that routes located in high erosion hazard terrain often result in direct and indirect erosion and sedimentation.

When designating UARs on the NFTS, there are risks regarding tread wear and loss of usability of the facility (e.g., erosion, rilling, gullying, etc.) and the off-site effects of the tread wear. The potential for impacts to watershed resources associated with designating UARs to the NFTS exists, especially on those with high EHRs. Some routes have the potential to erode but are not located near a stream channel. Nevertheless, even if there is not a risk to water quality, there remains a risk to off-site soil resources associated with gullying and overall loss in soil productivity.

On the UARs proposed for designation on the NFTS, mitigation measures reduce the impacts to soil resources from high-risk routes. Mitigations include rock surfacing, water bar installation, culvert installation and/or replacement, and route delineation (signage or physical barriers to restrict use to only designated routes). These types of measures have been used for drainage control on roads and trails on the SRNF for many years, and have been shown to be effective in controlling water, reducing erosion and sedimentation.

In both the short and long term, routes designated to the NFTS would remain compacted and unvegetated. No new ground disturbance would occur, as the routes already exist. The only ground disturbance would be associated with activities to improve drainage (waterbars, culvert removal/replacement) and to limit use to the designated travel way (route delineation and road barriers). These activities would occur only on the existing travel way, which is already a disturbed site. In the long term (10 to 30 years) sedimentation is expected to decrease from existing levels because mitigation measures and routine maintenance are expected to promote or enhance hydrologic function in sensitive areas.

2. Direct and indirect effects of changes to the NFTS

Short-term timeframe: 1 year.

Long-term timeframe: 25 to 30 years.

Spatial boundary: Smith River NRA and Gasquet Ranger District boundaries.

Indicators: 1) Miles of road upgraded (ML 1 to ML 2) by Region 5 average erosion hazard rating (low, moderate, high); 2) miles of road downgraded (ML 2 to ML 1) by Region 5 average erosion hazard rating (low, moderate, high); 3) miles of road decommissioned by Region 5 average erosion hazard rating (low, moderate, high); and 4) total acres recovered long-term soil productivity.

Methodology and Assumptions: All routes included in the proposed action were investigated on the ground by qualified Forest Service and private contractor earth scientists. Field review of routes existing road-related erosion, delivery potential and hydrologic connection to stream channels. A watershed risk rating (high, moderate, low) system was developed to summarize the route-specific data collected in the field (see *Water Quality* section). The assumption was made that routes in the high erosion hazard risk rating would continue to have the potential to erode and result in on- and off-site impacts until routes were designated and had maintenance and restorative treatments applied. No action includes all routes (authorized and unauthorized) in project area.

Rationale: Published studies (see *Affected Environment and Reference* sections) have documented that routes located in high erosion hazard terrain often result in direct and indirect erosion and sedimentation.

The ML 1 roads with high erosion hazard ratings are subject to have higher overall erosion rates, some of which may require additional road maintenance or stormproofing treatments to address the erosion risk. The roads that have erosion and water quality concerns would have specific project design features (repair/replace stream crossing culverts, install rolling dips to promote positive drainage) incorporated into the proposed action. The project design features reduce the risk to moderate or low levels because the actions are intended to reduce the amount of erosion, mass wasting potential and delivery of fine sediment into stream channels.

The indirect impacts to soils by changing maintenance levels would result in reductions in both on and off-site erosion and potential sedimentation since these roads would receive more frequent and additional road maintenance treatments, such as surface rocking, drainage structures, and culvert replacements or additions.

Treatments for ML 1 roads would include installation of a road barricade that restricts all motor vehicle traffic and stored in a maintenance free condition. Downgrading of roads, especially those in the high erosion hazard category, would result in lower overall tread wear and road-related erosion due to road closure and road maintenance treatments associated with placing roads into storage ML 1. These treatments include waterbarring and other stormproofing techniques designed to reduce potential erosion, sedimentation and diversion potential.

All roads that are decommissioned are considered beneficial to long-term soil productivity, especially those with high erosion hazard ratings since roads with these ratings are likely to have higher risk of tread wear and erosion hazard rates, and subsequent sedimentation and water quality risks. Roads removed from the NFTS would be decommissioned using heavy equipment. All culverts and associated fill would be removed and stored in stable locations. The travelway may be outsloped or decompacted and motor vehicle barriers would be installed. Because road decommissioning can result in short-term impacts to of soil erosion and water quality, mitigation measures such as; mulching, seeding, outsloping, waterbars, rip rap placement, and re-establishment of natural drainage pathways, restoring the stream channel to natural configuration (channel bottom widths and side slope gradients match the surrounding topography) would be implemented where appropriate. Long-term benefits would take effect once the treatment sites have recovered and stabilized (Switalski 2004).

3. Direct and indirect effects of restoration of drainage patterns.

Short-term timeframe: 1 year.

Long-term timeframe: 25 to 30 years.

Spatial boundary: Smith River NRA and Gasquet Ranger District boundaries.

Indicator: 1) Miles of routes restored (active and passive) by Region 5 average erosion hazard rating (low, moderate, high); and 2) acres of soil productivity restored in the long-term as a result of restoration of drainage patterns (active and passive) restoration treatments.

Methodology and Assumptions: All routes included in the proposed action were investigated on the ground by qualified Forest Service and private contractor earth scientists. Field review of routes documented the number and condition of road-stream crossings, existing road-related erosion, delivery potential and hydrologic connection to stream channels. The Region 5 erosion hazard risk rating (high, moderate, low) system was used to assess soil risks and benefits of the actions. The assumption was made that routes in the high erosion hazard risk rating would continue to have the potential to erode and result in on and off-site impacts until restorative treatments are applied.

Rationale: Published studies (see *Affected Environment* and *Reference* sections) have documented that routes located in high erosion hazard terrain often result in direct and indirect erosion and sedimentation.

General direct and indirect effects of unauthorized motorized routes include loss of soil site productivity through soil compaction (past effects during creation of unauthorized motorized routes) and offsite soil productivity through erosion (current indirect effect). Examples of active restoration treatments include waterbarring, rolling dips, removal of culverts and associated fills. Passive restoration includes the placement of a vehicle barrier at the entrance or junction to a road or route. The objective is to prevent motorized use and promote the passive restoration of the travelway (vegetation recovery).

Routes that have a high erosion hazard ratings, in the short-term, have a greater potential for continued indirect, off-site impacts to soils and watershed resources. Active treatments would have more success in reducing erosion and accelerating the timeframe for revegetation and improved soil productivity, especially those that have high erosion hazard ratings.

Passive restoration of drainage patterns on UARs would also be beneficial to long term soil productivity and recovery, but would be achieved over a longer period. Over time, affected soils would gradually recover through revegetation, their root systems aiding the decompaction of remnant soils. Vegetation regrowth on these routes is anticipated to accelerate in the long-term and further reduce the risk of soil erosion. Vegetation that grows on the route surface would intercept surface runoff, slowing and shortening the flow path to reduce the occurrence of concentrated runoff that leads to on-site and off-site erosion and impacts to water resources. By barricading of UARs and restricting future motorized use, erosion, compaction and other detrimental soil conditions would be reduced in the long term. Decompaction of the surface soils and vegetation regrowth is typically not limited due to the high level of winter precipitation and natural vegetation recovery found within the Smith River NRA. Active restoration of UARs (primarily waterbarring) would occur on those UARs that have been identified as posing a high or moderate watershed risk (see *Water Quality* section) and those that have existing erosion problems.

4. Direct and indirect effects of risk mitigations

Short-term timeframe: 1 year.

Long-term timeframe: 25 to 30 years.

Spatial boundary: Smith River NRA and Gasquet Ranger District boundaries.

Indicator: 1) Miles of UARs not designated on the NFTS being barricaded by Region 5 average high erosion hazard rating; and 2) miles of stormproofing treatments by Region 5 high erosion hazard risk rating.

Methodology and Assumptions: All routes included in the proposed action were investigated on the ground by qualified Forest Service and private contractor earth scientists. Field review of routes documented the number and condition of road-stream crossings, existing road-related erosion, delivery potential and hydrologic connection to stream channels. The Region 5 erosion hazard risk rating (high, moderate, low) system was used to assess soil risks and benefits of the actions. The assumption was made that routes in the high erosion hazard risk rating would continue to have the potential to erode and result in on and off-site impacts until restorative treatments are applied.

Rationale: Published studies (see *Affected Environment* and *Reference* sections) have documented that routes located in high erosion hazard terrain often result in direct and indirect erosion and sedimentation.

Resource risk mitigations apply to NFTS current and proposed roads and motorized trails to reduce risk and impacts to resources, including soils. When resource risks were identified as high or moderate in the Travel Analysis Process, mitigations are required to reduce the risk to an acceptable level. Stormproofing treatments would provide the greatest benefit to soil resources by addressing existing and potential surface erosion and drainage needs.

On the UARs to be added to the NFTS (both motorized trails and roads), mitigation measures to lessen the impacts to soil resources would occur on all high risk routes proposed to be added. Mitigations include rock surfacing, water bar installation, culvert installation and/or replacement, and route delineation (signage or physical barriers to restrict use to only designated routes). All mitigation measures would be completed prior to use by the public. Implementation of these mitigation measures is expected to lower higher risk routes to moderate or low risk, by managing runoff, minimizing offsite movement of soil, and preventing degradation of the running surfaces. These types of measures have been used for drainage control on forest roads and motorized trails for many years, and have been shown to be effective in controlling water, reducing erosion and sedimentation. In both the short and long term, routes designated to the NFTS would remain compacted and unvegetated. No new ground disturbance would occur, as the routes already exist. The only ground disturbance would be associated with activities to improve drainage (waterbars, culvert removal/replacement) and to limit use to the designated travel way (road barriers). These activities would occur only on the existing travel way, which is already a disturbed site. In the long term (10 to 30 years), sedimentation is expected to decrease from existing levels because mitigation measures and routine maintenance are expected to promote or enhance hydrologic function in sensitive areas.

All designated routes that have active surface erosion would have water bars installed, and other treatments to disperse water and reduce risk of erosion and offsite impacts. These would be achieved either through maintenance improvements associated with designating routes to the NFTS, or under the restoration of drainage patterns on UARs action (see *Water Quality* section for additional mitigations and routes to be treated). All mitigation measures would be completed prior to designation on the NFTS. Implementation of these mitigations is expected to reduce erosion on these routes.

Stormproofing on roads identified as having the potential (high or moderate risk) to impact water quality would benefit the soil resources and soil productivity by reducing on and off-site erosion, both short term and long term, depending on the type of specific treatment. Stormproofing includes maintenance actions that are intended to improve the roads resiliency to withstand larger storm events. Common treatments include installing larger diameter culverts at stream crossings; and constructing rolling dips, outsloping or spot rocking the travelway. Road stormproofing are expected to reduce the amount of fine sediment that is delivered to streams from surface erosion. Stormproofing actions are also expected to reduce the impacts of mass-wasting events through reducing the potential for stream channel diversion by replacing undersized culverts and hardening of road surfaces. In addition, routine maintenance activities would occur on all NFTS roads and motorized trails. Routine maintenance includes culvert and ditch cleaning, blading and grading of travel way, clearing and trimming of vegetation in travelway.

Cumulative Effects

The cumulative environmental effects of this project on the soil resource ultimately impact water quality and the integrity of the transportation network. They are addressed within the *Hydrology and Water Resources* and *Transportation Facilities* sections. The hydrology analysis includes the projected water quality effects of past, present and future foreseeable actions within the cumulative watershed effects analysis area, which encompasses the soil resource analysis area.

Cumulative impacts on human health are specific to the individual and depend on their personal history. They are not analyzed here because they are beyond the scope of this analysis.

Environmental Consequences

This section discloses the environmental effects of each of the alternatives as described by the selected soil indicators, and is focused on the effects of four actions: 1) designation of roads and motorized trails on the NFTS; 2) changes to the NFTS; 3) restoration of drainage patterns; and 4) risk reduction mitigations (barricades, stormproofing, seasonal gate closures). The types of environmental effects associated with each of the soil indicators are discussed above in the indicators, timeframes, spatial boundary, methodology and assumptions sections. All of the direct and indirect effects are analyzed and discussed with respect to the selected soil indicators and the four types of proposed activities for each of the alternatives. The alternatives differ in terms of miles of UARs designated on the NFTS. However, there is no difference between alternatives in the amount of routes that currently exist on the ground.

Alternative 1 – No Action

Direct and Indirect Effects

Routes Designated on the NFTS

There are no direct or indirect effects of designating UARs to the existing NFTS because under this alternative, none would be designated to the NFTS. The agency would take no affirmative action on any UAR and they would continue to have no status as NFTS facilities.

Upgrading Maintenance Level 1 Roads

No roads would be upgraded to ML 2 that would provide additional motorized access to high clearance vehicles. Vegetation recovery and encroachment within some road prisms would continue, providing additional soil cover, reducing soil loss, and decompacting roadbeds. However, inadequate some ML 1 roads would be subject to existing and increasing surface erosion due to road prism erosion, plugging of ditchlines, and inadequate drainage structures, further altering hillslope hydrology, and indirect loss of soil productivity.

Downgrading Maintenance Level 2 Roads

No roads would be downgraded to ML 1 that would prohibit future motorized access to high clearance vehicles. Maintenance Level 2 roads would continue to receive motorized use by both the public and for administrative use. The level of road maintenance would remain about the same as present. Road-related on-site and off-site surface erosion associated with motorized use would likely continue, some of which may result in sedimentation into streamcourses. There would be no change to long-term soil productivity, so benefits of downgrading roads to ML 1 would be foregone.

Decommissioning Roads

No NFTS roads would be decommissioned under this alternative. NFTS roads that have signs of erosion (e.g., rilling or rutting) on some portion(s) of them would not be treated; therefore existing erosion sites would continue to result in negative impacts to soil productivity and water quality. Long-term soil productivity would continue to decline on these sites, since road surfaces would remain in a high degree of soil compaction. There would be no long-term benefits to the soil resource associated with decommissioning of NFTS roads and trails.

Restoration of Drainage Patterns on UARs

The direct effects to loss in soil productivity have already occurred. Past cross-country motorized travel on UARs has resulted in soil compaction, displacement and erosion of the soil to the point where vegetation productivity in the disturbed areas has been reduced. The inventoried 59 sites with erosion features located on approximately 36 miles of UARs would not be restored or mitigated. The UARs within the Smith River NRA that total about 155 miles would continue to receive unintended illegal motorized use, at least 97 miles (63 percent) have high erosion hazard ratings that are subject to higher erosion rates, off-site impacts and difficulty in establishing vegetation. There would be ongoing impacts to soil productivity from the potential unintended illegal use at risk of occurring. There would be no active or passive restoration treatments to UARs where existing erosion, water diversions and sedimentation is occurring. No additional barricades would be installed to prohibit motorized vehicles. In both the short and long term, soils on about 310 acres would remain compacted and unvegetated.

Resource Risk Mitigations

Under Alternative 1, there would be no resource risk mitigations applied to the NFTS to reduce impacts to resources, most notably stormproofing that would benefit the soil resource. NFTS roads and motorized trails that have signs of erosion (e.g., rilling or rutting) would not be treated. No road improvements that reduce erosion, road drainage and sedimentation such as culvert removal or installation, replacements, and additional drainage structures, thereby leading to higher risk of future erosion and sedimentation.

Some ML 1 roads with existing surface erosion would increase over time due to road prism erosion, plugging of ditchlines, and inadequate drainage structures, further altering hillslope hydrology, and would result in an indirect loss of soil productivity.

Summary of Direct and Indirect Effects on Soil Productivity

The No Action alternative would result in a total of 97 miles (63 percent) of UARs rated as high erosion hazard risk to watershed resources and water quality concerns remaining on the NFTS.

Soil productivity would be foregone in the long term on all 155 miles (310 acres) of UARs that continue to be used, and on roads designated to the NFTS through ongoing and foreseeable road-related actions.

Common to All Action Alternatives

Changes to NFTS

Downgrade ML 3 to ML 2

NFTS road 17N49 (Gasquet Mountain Road) and 17N07 would be downgraded from an ML 3 road to ML 2 to facilitate mixed-use activities (suitable for ATVs and high-clearance motor vehicles). Downgrading from ML 3 to ML 2 would have no effect to the soil resource because it would not require any additional ground disturbance that would have an adverse impact to soils; therefore, there would be no direct or indirect effects because of the action.

Risk Mitigations

Bridge Repair

The repair and maintenance of the Griffin Creek Bridge would require the use of heavy equipment and would create some ground disturbance associated with the installation of two new footings, each located between the existing abutments. This work would occur generally within the existing area disturbed by the existing bridge, and therefore impacts to the soil resource would be negligible. There would be a potential for soil erosion around the bridge abutments on both streambanks, but existing mitigation measures and BMP’s identified in Chapter 2 would minimize erosion off-site and sedimentation into Griffin Creek. In the long term, the reinforced bridge would provide reliable access to the watershed for road maintenance activities and would be a low risk to the soil resource.

Alternative 4

Direct and Indirect Effects

Routes Designated to the NFTS

Of the routes to be designated to the NFTS, about 4.1 miles (5.8 percent) were rated as low erosion hazard rating, 9.3 miles (13.3 percent) have a moderate erosion hazard, and about 56.7 miles (80.9 percent) have a high erosion hazard risk rating, as shown in Table 3-109. This high rating indicates that there is the potential for tread wear of the facility and increased risk of soil erosion and potential for sedimentation.

Table 3-109. Miles of UARs designated to NFTS by erosion hazard risk rating.

Risk Rating	Miles	Percent of total
Low	4.1	5.8
Moderate	9.3	13.3
High	56.7	80.9

Under this alternative, eight UARs (2.72 miles) of the 36 inventoried priority sites that have identified erosion features in need of rehabilitation. These features would be receive restorative treatments prior to being designated to the NFTS. These sites are displayed in Table 3-110.

Table 3-110. Unauthorized motorized routes (UARs) to be designated to NFTS that have priority erosion sites in need of rehabilitation.

ID	Length (miles)	ID	Length (miles)	ID	Length (miles)
424.105	0.29	303.130	1.13	17N49.11	0.09
427.103	0.05	1749.11P	0.09	17N49.7	0.81
427.106	0.09	1749.102	0.17		
Total Miles: 2.72					

On the UARs to be added to the NFTS (both motorized trails and roads), mitigation measures to lessen the impacts to soil resources would occur on all high risk routes proposed to be added. Mitigations include rock surfacing, water bar installation, culvert installation and/or replacement, and route delineation (signage or physical barriers to restrict use to only designated routes). All mitigation measures would be completed prior to use by the public. Implementation of these mitigation measures is expected to lower higher risk routes to moderate or low risk, by managing runoff, minimizing offsite movement of soil, and preventing degradation of the running surfaces. These types of measures have been used for drainage control on forest roads and trails for many years, and have been shown to be effective in controlling water, reducing erosion and sedimentation. In both the short and long term, routes designated to the NFTS will remain compacted and unvegetated. No new ground disturbance would occur, as the routes already exist. The only ground disturbance would be associated with activities to improve drainage (waterbars, culvert removal/replacement) and to limit use to the designated travel way (road barriers). These activities would occur only on the existing travelway, which is already a disturbed site.

Upgrading Maintenance Level 1 Roads

This alternative would upgrade 11 miles of ML 1 (closed) roads to ML 2 (open) status. Of these roads, none are rated as a low risk, 10.3 miles (92 percent) have a moderate EHR rating, and 0.9 mile (8.0 percent) have a high EHR rating, as displayed in Table 3-111. The ML 1 roads with high erosion hazard ratings are subject to have higher overall erosion rates, some of which may require additional road maintenance treatments to address the erosion risk. The roads that have erosion and water quality concerns would have specific project design features (repair/replace stream crossing culverts, install rolling dips to promote positive drainage) incorporated into the proposed action. The project design features reduce the risk to moderate or low levels because the actions are intended to reduce the amount of erosion, mass wasting and delivery of fine sediment into stream channels.

Table 3-111. Miles of roads designated on NFTS to be upgraded from ML 1 to 2 by erosion hazard risk rating.

Risk Rating	Miles	Percent of total
Low	0.0	0.0
Moderate	10.3	92.0
High	0.9	8.0

The direct and indirect impacts to soils by changing maintenance levels would result in improvements to on- and off-site erosion and potential sedimentation since these roads would receive more frequent and additional road maintenance treatments, such as surface rocking, drainage structures, and culvert replacements or additions. However, by opening these roads that have been previously closed to motorized vehicles, there would be a slight increase in risk of road-related erosion and potential road delivered sedimentation associated with increased motorized traffic.

These routes are not expected to receive a lot of use, and road maintenance improvements, project design features and maintenance inspections should address erosion concerns.

Soil productivity would remain foregone on about 22.4 acres.

Downgrading Maintenance Level 2 Roads

Of the NFTS roads proposed for downgrading to ML 1, about 0.5 mile (3.2 percent) have been rated as low EHR , 9.8 miles (62.8 percent) as a moderate risk, and 5.3 miles (34 percent) as a high risk, as displayed in Table 3-112. Roads that are downgraded to ML 1 would be evaluated for erosion and sedimentation concerns. Drainage structures and other road treatments would be installed along with closure devices would address on and off-site watershed concerns, maintain the infrastructure, and block vehicle access. Over the long term (25 to 30 years), where vehicle use of a route is discontinued, some vegetation would become established within the road prism, providing vegetative cover, adding organic matter, reducing the degree of soil compaction, surface erosion and increasing soil porosity and infiltration.

National Forest Transportation System roads that are downgraded from ML 3 to ML 2 have no effect on the soil resource and are therefore not analyzed in this section.

There would be no change in overall soil productivity, with about 32 acres remaining in an unproductive state.

Table 3-112. Miles of routes designated on NFTS to be downgraded ML 2 to 1 by erosion hazard risk rating.

Risk Rating	Miles	Percent
Low	0.5	3.2
Moderate	9.8	62.8
High	5.3	34.0

Decommissioning Roads

Alternative 4 would remove (decommission) a total of about 50 miles of roads from the NFTS. Of the total miles to be decommissioned, 0.1 (0.2 percent) were rated with a low EHR, 32.6 miles (65.2 percent) rated with a moderate EHR, and 17.3 miles (34.6 percent) rated with a high EHR, as displayed in Table 3-113. All roads that are decommissioned are considered beneficial to long-term soil productivity, especially those with high erosion hazard ratings since roads with these ratings are likely to have higher risk of tread wear and erosion hazard rates, and subsequent sedimentation and water quality risks. Roads removed from the NFTS would be decommissioned using heavy equipment. All culverts and associated fill would be removed and stored in stable locations. The travelway may be outsloped or decompacted and motor vehicle barriers would be installed. Because road decommissioning can result in short-term impacts to of soil erosion and water quality, mitigation measures such as; mulching, seeding, outsloping, waterbars, rip rap placement, and re-establishment of natural drainage pathways, restoring the stream channel to natural configuration (channel bottom widths and side slope gradients match the surrounding topography) would be implemented where appropriate.

Of the miles proposed to be removed from the NFTS, soil productivity would be expected to eventually return on a total of about 100 acres.

Table 3-113. Miles of routes designated on NFTS to be decommissioned by erosion hazard risk rating.

Risk Rating	Miles	Percent
Low	0.1	0.2
Moderate	32.6	65.2
High	17.3	34.6

Restoration of Drainage Patterns

Under this alternative, about 70.1 miles of UARs would be restored, which includes both active and/or passive restoration treatments. Of these, about 33.3 miles (47.5 percent) were rated as moderate, and 36.8 miles (52.5 percent) were rated with a high EHR, as displayed in Table 3-114.

Table 3-114. Miles of UARs receiving restoration of drainage patterns treatments by erosion hazard risk rating.

Risk Rating	Miles	Percent
Low	0	0
Moderate	33.3	47.5
High	36.8	52.5

Active restoration treatments include waterbarring, rolling dips, removal of culverts and associated fills. Passive restoration includes the placement of a vehicle barrier at the entrance or junction to a road or route. The objective is to prevent motorized use and promote the passive restoration of the travelway (vegetation recovery).

Passive restoration of drainage patterns on UARs would also be beneficial to long-term soil productivity and recovery, but would be achieved over a longer period. Over time, affected soils would gradually recover through revegetation, their root systems aiding the decompaction of remnant soils. Vegetation regrowth on these routes is anticipated to accelerate in the long-term and further reduce the risk of soil erosion. Vegetation that grows on the route surface would intercept surface runoff, slowing and shortening the flow path to reduce the occurrence of concentrated runoff that leads to on-site and off-site erosion and impacts to water resources. By barricading of UARs and restricting future motorized use, erosion, compaction and other detrimental soil conditions would be reduced in the long term. Decompaction of the surface soils and vegetation regrowth is typically not limited due to the high level of winter precipitation and natural vegetation recovery found within the Smith River NRA.

Soil productivity would be expected to eventually return on a total of 140.2 acres.

Resource Risk Mitigations

Resource risk mitigations apply to NFTS current and proposed roads and trails to reduce risk and impacts to resources, including soils. When resource risks were identified as high or moderate in the Travel Analysis Process, mitigations are required to reduce the risk to an acceptable level. Stormproofing treatments would provide the greatest benefit to soil resources by addressing existing and potential surface erosion and drainage needs.

Seasonal Gate Closure

Seasonal gate closures are another form of resource risk mitigation. This alternative would place a total of 22 miles of NFTS roads and motorized trails with either a seasonal or year-round gate closure. By placing gates on these NFTS routes, motorized use would be restricted to when routes are dry, thereby reducing risk of road-delivered sedimentation associated with motorized vehicle use when road surfaces are wet.

Stormproofing

Stormproofing treatments on about 111.7 miles of NFTS roads and motorized trails would occur under this alternative. All activities would occur within the existing travelway; no new ground disturbance is expected. Treatments on these roads and trails would be beneficial in reducing soil impacts. Overall soil productivity would remain unchanged, although indirect benefits to soil productivity would be achieved by reducing onsite erosion and off-site erosion and sedimentation.

Summary of Direct and Indirect Effects on Soil Productivity

Soil productivity would be adversely affected on all routes and facilities that are designated to the NFTS through this project or through ongoing and foreseeable road-related actions. The ongoing and foreseeable road-related actions are described in the *Water Quality Cumulative Effects* section of this chapter. Soil conditions should improve with eventual natural loosening of the compacted soil and revegetation on decommissioned roads, active/passive restoration of drainage patterns on UARs, and resource risk mitigation treatments.

Implementation of Alternative 4 overall would result in 70 miles (140 acres) of UARs designated to the NFTS as motorized trails and roads, thereby resulting in a long term negative effect to soil productivity. This alternative would also decommission, restore and close 120 miles (240 acres) of UARs and NFTS roads, resulting in a long-term beneficial effect for soil productivity. Overall, a net long-term benefit of about 100 acres of the soil resource would be improved or restored.

Alternative 5

Direct and Indirect Effects

Routes Designated on the NFTS

There are about 16.2 miles of UARs that would be designated to the NFTS under Alternative 5. About 1.0 mile (6.2 percent) are rated with a low EHR, 7.8 miles (48.1 percent) are rated with a moderate EHR, and 7.4 miles (45.7 percent) are rated with a high EHR, displayed in Table 3-115. The routes to be designated to the NFTS as motorized routes that have a high erosion hazard risk rating indicates that there is the potential for tread wear of the facility and increased risk of soil erosion and potential for sedimentation.

Table 3-115. Miles of UARs designated to NFTS by erosion hazard risk rating.

Risk Rating	Miles	Percent of total
Low	1.0	6.2
Moderate	7.8	48.1
High	7.4	45.7

Under this alternative, two UARs (1.2 miles), displayed in Table 3-116, of the 36 inventoried sites that have varying degrees of rilling, rutting or other forms of erosion would receive restorative treatments prior to being designated to the NFTS. All routes identified with erosion would have water bars installed to disperse water and reduce risk of erosion and offsite impacts through maintenance improvements associated with designating routes to the NFTS.

Table 3-116. Unauthorized motorized routes (UARs) to be designated to NFTS that have priority erosion sites in need of rehabilitation.

UAR Number	Length (Miles)
427.105	0.3
17N49.102	0.9
Total	***1.2***

On the UARs to be added to the NFTS (both motorized trails and roads), mitigation measures to lessen the impacts to soil resources would occur on all high risk routes proposed to be added. Mitigations include rock surfacing, water bar installation, culvert installation and/or replacement, and route delineation (signage or physical barriers to restrict use to only designated routes). All mitigation measures would be completed prior to use by the public. Implementation of these mitigation measures is expected to lower higher risk routes to moderate or low risk, by managing runoff, minimizing offsite movement of soil, and preventing degradation of the running surfaces. These types of measures have been used for drainage control on forest roads and trails for many years, and have been shown to be effective in controlling water, reducing erosion and sedimentation. In both the short and long term, routes designated to the NFTS will remain compacted and unvegetated. No new ground disturbance would occur, as the routes already exist. The only ground disturbance would be associated with activities to improve drainage (waterbars, culvert removal/replacement) and to limit use to the designated travel way (road barriers). These activities would occur only on the existing travelway, which is already a disturbed site.

Upgrading Maintenance Level 1 Roads

This alternative would move 4.2 miles of ML 1 (closed) roads to ML 2 (open) status. Of this total mileage, 3.3 miles (78.6 percent) have a moderate erosion hazard rating, while the remaining 0.9 mile (22.4 percent) are rated as high erosion hazard risk rating, as displayed in Table 3-117. The ML 1 roads with high erosion hazard ratings are subject to have higher overall erosion rates, some of which may require additional road maintenance treatments to address the erosion risk. The roads that have erosion and water quality concerns would have specific project design features (repair/replace stream crossing culverts, install rolling dips to promote positive drainage) incorporated into the proposed action. The project design features reduce the risk to moderate or low levels because the actions are intended to reduce the amount of erosion, mass wasting and delivery of fine sediment into stream channels.

Table 3-117. Miles of routes to be upgraded ML 1 to 2 by erosion hazard risk rating.

Risk Rating	Miles	Percent
Low	0	0
Moderate	3.3	78.6
High	0.9	22.4

The direct and indirect impacts to soils by changing maintenance levels would result in improvements to on- and off-site erosion and potential sedimentation since these roads would receive more frequent and additional road maintenance treatments, such as surface rocking, drainage structures, and culvert replacements or additions. However, by opening roads that have been previously closed to motorized vehicles, there would be a slight increase in risk of road-related erosion and potential road delivered sedimentation associated with increased motorized traffic.

These routes are not expected to receive a lot of use, and road maintenance improvements, project design features and maintenance inspections should address erosion concerns.

Soil productivity would remain foregone on these 4.2 miles (8.4 acres).

Downgrading Maintenance Level 2 Roads

Of the NFTS roads proposed for downgrading to ML 1, about 0.8 mile (1.5 percent) have been rated with a low EHR , 28.9 miles (55.7 percent) with a moderate risk, and 22.2 miles (42.8 percent) with a high risk, as displayed in Table 3-118. Roads that are downgraded to ML 1 would be evaluated for erosion and sedimentation concerns. Drainage structures and other road treatments would be installed, along with closure devices, that would address on and off-site watershed concerns, maintain the infrastructure, and block vehicle access. Over the long term (25 to 30 years), where vehicle use of a route is discontinued, some vegetation would become established within the road prism, providing vegetative cover, providing additions of organic matter, reducing the degree of soil compaction, surface erosion and increasing soil porosity and infiltration.

There would be no change in overall soil productivity, with 104 acres remaining in an unproductive state.

Table 3-118. Miles of routes designated for downgrading ML 2 to 1 by erosion hazard risk rating.

Risk Rating	Miles	Percent of total
Low	0.8	1.5
Moderate	28.9	55.7
High	22.2	42.8

Decommissioning Roads

Alternative 5 would remove (decommission) a total of about 104 miles of roads from the NFTS. Of the miles proposed to be removed from the NFTS, 1.8 mile (1.7 percent) was rated with a low EHR, 66.2 miles (63.7 percent) with a moderate EHR, and 36 miles (34.6 percent) were rated with a high EHR, as displayed in Table 3-119.

Table 3-119. Miles of routes designated on NFTS to be decommissioned by erosion hazard risk rating.

Risk Rating	Miles	Percent
Low	1.8	1.7
Moderate	66.2	63.7
High	36	34.6

All roads that are decommissioned are considered beneficial to long-term soil productivity, especially those with high erosion hazard ratings since roads with these ratings are likely to have higher risk of tread wear and erosion hazard rates, and subsequent sedimentation and water quality risks. Roads removed from the NFTS would be decommissioned using heavy equipment. All culverts and associated fill would be removed and stored in stable locations. The travelway may be outsloped or decompacted and motor vehicle barriers would be installed. Because road decommissioning can result in short-term impacts to of soil erosion and water quality, mitigation measures such as; mulching, seeding, outsloping, waterbars, rip rap placement, and re-establishment of natural drainage pathways, restoring the stream channel to natural configuration (channel bottom widths and side slope gradients match the surrounding topography) would be implemented where appropriate.

Soil productivity would be expected to eventually return on a total of 208 acres.

Restoration of Drainage Patterns

Under Alternative 5, 132.6 miles of UARs and would receive restoration of drainage patterns that includes both active and/or passive restoration treatments. Of these, about 43.2 miles (32.6 percent) were rated as moderate, and 89.4 miles (67.4 percent) were rated with a high EHR, as displayed in Table 3-120. Soil productivity would be expected to eventually return on a total of 278 acres.

Table 3-120. Miles of UARs receiving restoration of drainage patterns treatments by erosion hazard risk rating.

Risk Rating	Miles	Percent of Total
Low	0	0
Moderate	43.2	32.6
High	89.4	67.4

Active restoration treatments include waterbarring, rolling dips, removal of culverts and associated fills. Passive restoration includes the placement of a vehicle barrier at the entrance or junction to a road or route. The objective is to prevent motorized use and promote the passive restoration of the travelway (vegetation recovery).

Passive restoration of drainage patterns on UARs would also be beneficial to long term soil productivity and recovery, but would be achieved over a longer period. Over time, affected soils would gradually recover through revegetation, their root systems aiding the decompaction of remnant soils. Vegetation regrowth on these routes is anticipated to accelerate in the long-term and further reduce the risk of soil erosion. Vegetation that grows on the route surface would intercept surface runoff, slowing and shortening the flow path to reduce the occurrence of concentrated runoff that leads to on-site and off-site erosion and impacts to water resources. By barricading of UARs and restricting future motorized use, erosion, compaction and other detrimental soil conditions would be reduced in the long term. Decompaction of the surface soils and vegetation regrowth is typically not limited due to the high level of winter precipitation and natural vegetation recovery found within the Smith River NRA.

Soil productivity would be expected to eventually return on a total of 265.2 acres.

Resource Risk Mitigations

Seasonal Gate Closure

This alternative would place about 8.0 of NFTS roads and motorized trails with either a seasonal or year-round gate closure. By placing gates on these NFTS routes, motorized use would be restricted to when routes are dry, thereby reducing risk of road-related erosion and potential sedimentation.

Stormproofing

Stormproofing treatments on about 58.6 miles of NFTS roads and motorized trails would occur under this alternative. All activities would occur within the existing travelway; no new ground disturbance is expected. Treatments on these roads and trails would be beneficial in reducing soil impacts. Overall soil productivity would remain unchanged, although indirect benefits to soil productivity would be achieved by reducing onsite erosion and off-site erosion and sedimentation.

Summary of Direct and Indirect Effects on Soil Productivity

Soil productivity would be adversely affected on all routes and facilities that are designated to the NFTS through this project or through ongoing and foreseeable road-related actions. Soil conditions should improve with eventual natural loosening of the compacted soil and revegetation of decommissioned roads, active/passive restoration of drainage patterns on UARs, and resource risk mitigation treatments.

Implementation of Alternative 5 overall would result in 16.2 miles (32.4 acres) of UARs designated to the NFTS as motorized trails and roads, thereby resulting in a long term negative effect to soil productivity. This alternative would also decommission, restore and close 236.5 miles (473 acres) of UARs and NFTS roads, resulting in a long-term beneficial effect for soil productivity. Overall, a net long-term benefit of about 440.6 acres of the soil resource would be improved or restored.

Alternative 6

Direct and Indirect Effects

Routes Designated to the NFTS

As shown in Table 3-121, about 60.5 UARs would be designated to the NFTS under Alternative 6. About 3.8 miles (6.3 percent) are rated with a low EHR, 13.8 miles (22.8 percent) are with a rated moderate EHR, and 42.9 miles (70.9 percent) are rated with a high EHR. The routes to be designated to the NFTS as motorized routes that have a high erosion hazard risk rating indicates that there is the potential for tread wear of the facility and increased risk of soil erosion and potential for sedimentation.

Table 3-121. Miles of UARs designated to NFTS by erosion hazard risk rating.

Risk Rating	Miles	Percent of Total
Low	3.8	6.3
Moderate	13.8	22.8
High	42.9	70.9

Under this alternative, six UARs (3.41 miles) displayed in Table 3-122 below of the 36 inventoried sites that have varying degrees of rilling, rutting or other forms of erosion would be receive restorative treatments prior to being designated to the NFTS. All routes identified with erosion would have water bars installed to disperse water and reduce risk of erosion and offsite impacts through maintenance improvements associated with designating routes to the NFTS.

Table 3-122. Unauthorized motorized routes (UARs) to be designated to NFTS that have priority erosion sites in need of rehabilitation.

UAR Number	Length (miles)	UAR Number	Length (miles)
427.105	0.29	305.130	1.13
427.106	0.09	1749.7A	0.81
17N49.11P	0.19	1749.102	0.90
Total Miles = 3.41			

On the UARs to be added to the NFTS (both motorized trails and roads), mitigation measures to lessen the impacts to soil resources would occur on all high risk routes proposed to be added. Mitigations include rock surfacing, water bar installation, culvert installation and/or replacement, and route delineation (signage or physical barriers to restrict use to only designated routes). All mitigation measures would be completed prior to use by the public. Implementation of these mitigation measures is expected to lower higher risk routes to moderate or low risk, by managing runoff, minimizing offsite movement of soil, and preventing degradation of the running surfaces. These types of measures have been used for drainage control on forest roads and trails for many years, and have been shown to be effective in controlling water, reducing erosion and sedimentation. In both the short and long term, routes designated to the NFTS will remain compacted and unvegetated. No new ground disturbance would occur, as the routes already exist. The only ground disturbance would be associated with activities to improve drainage (waterbars, culvert removal/replacement) and to limit use to the designated travel way (road barriers). These activities would occur only on the existing travel way, which is already a disturbed site.

Upgrading Maintenance Level 1 Roads

This alternative would move about 4.2 miles of ML 1 (closed) roads to ML 2 (open) status. Of this total mileage, about 0 miles are rated as low risk, 3.3 miles (78.6 percent) have a moderate erosion hazard rating, while the remaining 0.9 mile (21.4 percent) are rated as high erosion hazard risk rating, as displayed in Table 3-123. The ML 1 roads with high erosion hazard ratings are subject to have higher overall erosion rates, some of which may require additional road maintenance treatments to address the erosion risk. The roads that have erosion and water quality concerns would have specific project design features (repair/replace stream crossing culverts, install rolling dips to promote positive drainage) incorporated into the proposed action. The project design features reduce the risk to moderate or low levels because the actions are intended to reduce the amount of erosion, mass wasting and delivery of fine sediment into stream channels.

Table 3-123. Miles of routes to be upgraded ML 1 to 2 by erosion hazard risk rating.

Risk Rating	Miles	Percent of Total
Low	0	0
Moderate	3.3	78.6
High	0.9	21.4

The direct and indirect impacts to soils by changing maintenance levels would result in improvements to on- and off-site erosion and potential sedimentation since these roads would receive more frequent and additional road maintenance treatments, such as surface rocking, drainage structures, and culvert replacements or additions. However, by opening roads that have been previously closed to motorized vehicles, there would be a slight increase in risk of road-related erosion and potential road delivered sedimentation associated with increased motorized traffic.

These routes are not expected to receive a lot of use, and road maintenance improvements, project design features and maintenance inspections should address erosion concerns.

Soil productivity would remain foregone on these 4.2 miles (8.4 acres).

Downgrading Maintenance Level 2 Roads

Of the NFTS roads proposed for downgrading to ML 1, about 0.6 mile (2.8 percent) have been rated with a low EHR , 12.4 miles (58.2 percent) with a moderate EHR, and 7.2 miles (33.8 percent) with a high EHR, displayed in Table 3-124. Drainage structures and other road treatments would be installed along with closure devices would address on and off-site watershed concerns, maintain the infrastructure, and block vehicle access. Over the long term (25 to 30 years), where vehicle use of a route is discontinued, some vegetation would become established within the road prism, providing vegetative cover, adding organic matter, reducing the degree of soil compaction, surface erosion and increasing soil porosity and infiltration.

There would be no change in overall soil productivity, with 40.4 acres remaining in an unproductive state.

Table 3-124. Miles of routes designated for downgrading ML 2 to 1 by erosion hazard risk rating.

Risk Rating	Miles	Percent
Low	0.6	3.0
Moderate	12.4	61.4
High	7.2	35.6

Decommissioning Roads

Of the miles proposed to be removed from the NFTS, 0.1 miles (0.2 percent) were rated with a low EHR, 39.1 miles (79.5 percent) with a moderate EHR, and 10 miles (20.3 percent) were rated with a high EHR, displayed in Table 3-125.

Roads removed from the NFTS would be decommissioned using heavy equipment. All culverts and associated fill would be removed and stored in stable locations. The travelway may be outsloped or decompacted and motor vehicle barriers would be installed. Because road decommissioning can result in short-term impacts to of soil erosion and water quality, mitigation measures such as; mulching, seeding, outsloping, waterbars, rip rap placement, and re-establishment of natural drainage pathways, restoring the stream channel to natural configuration (channel bottom widths and side slope gradients match the surrounding topography) would be implemented where appropriate.

Soil productivity would be expected to eventually return on a total of about 98.4 acres.

Table 3-125. Miles of routes designated on NFTS to be decommissioned by erosion hazard risk rating.

Risk Rating	Miles	Percent
Low	0.1	0.2
Moderate	39.1	79.5
High	10.0	20.3

Restoration of Drainage Patterns

Under Alternative 6, about 188.6 miles of UARs would receive restoration of drainage patterns that includes both active and/or passive restoration treatments. Of these, about 1.7 miles (0.9 percent) are rated with a low EHR, about 75.9 miles (40.4 percent) were rated with a moderate EHR, and 111.0 miles (59.0 percent) were rated with a high EHR, as displayed in Table 3-126.

Table 3-126. Miles of UARs receiving restoration of drainage patterns treatments by erosion hazard risk rating.

Risk Rating	Miles	Percent
Low	1.7	0.9
Moderate	75.9	40.4
High	111	59.0

Active restoration treatments include waterbarring, rolling dips, removal of culverts and associated fills. Passive restoration includes the placement of a vehicle barrier at the entrance or junction to a road or route. The objective is to prevent motorized use and promote the passive restoration of the travelway (vegetation recovery).

Passive restoration of drainage patterns on UARs would also be beneficial to long term soil productivity and recovery, but would be achieved over a longer period. Over time, affected soils would gradually recover through revegetation, their root systems aiding the decompaction of remnant soils. Vegetation regrowth on these routes is anticipated to accelerate in the long-term and further reduce the risk of soil erosion. Vegetation that grows on the route surface would intercept surface runoff, slowing and shortening the flow path to reduce the occurrence of concentrated runoff that leads to on-site and off-site erosion and impacts to water resources. By barricading of UARs and restricting future motorized use, erosion, compaction and other detrimental soil conditions would be reduced in the long term. Decompaction of the surface soils and vegetation regrowth is typically not limited due to the high level of winter precipitation and natural vegetation recovery found within the Smith River NRA. Active restoration of UARs (primarily waterbarring) would occur on those UARs that have been identified as posing a high or moderate watershed risk (see *Water Quality* section) and those that have existing erosion problems.

Soil productivity would be expected to eventually return on a total of 377.6 acres.

Resource Risk Mitigations

Seasonal Gate Closure

This alternative would also place about 13 miles of NFTS roads and motorized trails with either a season-of-use or year-round gate closure that would be reinforced through seasonal gate closures.

By placing gates on these NFTS routes, motorized use would be restricted to when routes are dry, thereby reducing risk of road-related erosion and potential sedimentation.

Stormproofing

Stormproofing treatments on about 106 miles of NFTS roads and motorized trails would occur under this alternative. All activities would occur within the existing travelway; no new ground disturbance is expected. Treatments on these roads and trails would be beneficial in reducing soil impacts. Overall soil productivity would remain unchanged, although indirect benefits to soil productivity would be achieved by reducing onsite erosion and off-site erosion and sedimentation.

Summary of Direct and Indirect Effects on Soil Productivity

Soil productivity would be adversely affected on all routes and facilities that are designated to the NFTS through this project or through ongoing and foreseeable road-related actions. Soil conditions should improve with eventual natural loosening of the compacted soil and revegetation of decommissioned roads, active/passive restoration of drainage patterns on UARs, and resource risk mitigation treatments.

Implementation of Alternative 6 overall would result in 60.5 miles (121 acres) of UARs designated to the NFTS as motorized trails and roads, thereby resulting in a long term negative effect to soil productivity. This alternative would also decommission, restore and close 238 miles (476 acres) of UARs and NFTS roads, resulting in a long-term beneficial effect for soil productivity. Overall, a net long-term benefit of about 355 acres of the soil resource would be improved or restored.

Summary of Effects Analysis across All Alternatives

Effects to soil resources as summarized by ranking each indicator for each alternative. Table 3-127 provides the numeric value of the indicator and the relative ranking among alternatives in parenthesis. Higher rankings (4) indicate more benefits and/or less adverse effects to the soil resource for those alternatives and lower rankings (1) indicate the least benefit and/or most adverse effects to the soil resource. Rankings are an average for each alternative.

Table 3-127. Comparison of effects to the soil resource by miles.

Indicators – Soil Resource	Rankings of Alternatives by Indicator[55]			
	Alternative 1	Alternative 4	Alternative 5	Alternative 6
Miles of UARs designated as motorized trails or NFTS roads by EHR (High, Mod and Low)	High EHR – 0 Mod and Low – 0 (1)	High EHR – 57 Mod and Low – 13 (4)	High EHR – 7 Mod and Low – 9 (2)	High EHR – 43 Mod and Low – 18 (3)
Miles of NFTS Roads to be decommissioned by EHR (High, Moderate and Low)	High EHR – 0 Mod and Low – 0 (1)	High EHR – 17 Mod and Low – 33 (3)	High EHR – 36 Mod and Low – 68 (4)	High EHR – 10 Mod and Low – 39 (2)
Miles of UARs restored drainage pattern by EHR (High, Mod and Low)	0 miles (1)	High EHR – 33 Mod and Low – 37 (2)	High EHR – 89 Mod and Low – 43 (3)	High EHR – 111 Mod and Low – 78 (4)
Soils Effects: Acres of net soil productivity improved	Forgone – 310 acres Improved/Restored – 0 acres Net 0 acres improved (1)	Forgone – 140 Improved/Restored – 240 acres Net 100 acres improved (2)	Forgone – 32 Improved/Restored – 473 acres Net 441 acres improved (4)	Forgone – 121 Improved/Restored – 294 acres Net 173 acres improved (3)
Indicator Score	**1.0**	**2.8**	**3.3**	**3.00**
Reducing the Risks of Adverse Impacts to Soil Productivity	**(1)**	**(2)**	**(3)**	**(4)**

Comparison of the soil resource indicators in the table above reveals that there is not a significant difference concerning impacts to the soil resource in Alternative 4, 5, and 6. However, because all the roads and routes analyzed already exist on the ground, some effects to the soil resource have already occurred. The continued effects from these roads and routes are similar under Alternative 1 and 4.

The primary difference between all the action alternatives is the amount of road restoration and decommissioning treatments proposed.

Alternative 5 predicts the least impacts to the soil resource and provides the greatest benefits to long-term soil productivity because it proposes more road decommissioning and restoration of UARs (approximately 221 miles that would result in about 441 acres of that would become part of the

[55] A score of 4 indicates the alternative is the most beneficial or has the least adverse impact to soil productivity related to the indicator. A score of 1 indicates the alternative has the least benefit or has the most impact to soil productivity related to the indicator.

productive land base in the long term. Alternative 6 also provides for greater protection of the soil resources as compared to alternates 1 and 4. Table 3-127 also clearly displays Alternative 1 (No Action) as having the most impact to the soil resource because it maintains the status quo and does not provide for active road restoration, decommissioning and other actions that protect or improve the soil productivity.

Other differences between the action alternatives are the ability of the UARs to recover, through both active and passive restoration, decommissioning and other treatments. The extent of the prohibition of motorized vehicles varies considerably by action alternative. The ability to recover is based on existing erosion and inherent site characteristics (e.g., slope steepness, erosion hazard rating). Alternatives 5 and 6 show less indirect impacts to soils than Alternative 4 primarily due to the greater amount restoration of UARs and decommissioning in Alternatives 5 and 6.

When considering the full array of proposed actions, Alternative 1 and 4 predict greater impacts to the soil resource, while Alternative 5 and 6 lesser impacts.

Compliance with the Forest Plan and Other Direction

A list of standards and guidelines and BMPs that apply to this project are included in Appendix D. All standards, guidelines, and BMPs apply to all action alternatives. Mitigation measures were proposed to have compliance with the Forest Plan and Clean Water Act.

Alternative 1 does not address the resource risk presented by UARs where soil productivity could be compromised in the long term. This is inconsistent with Forest Plan direction to maintain or enhance soil resources, and with the Clean Water Act.

Under any action alternative, substantial gains in soil productivity would be realized in the long term due to the prohibition of unauthorized motorized vehicle travel, which is consistent with Forest Plan direction. Additionally, gains in soil productivity because of the restorative treatments to the NFTS roads, primarily decommissioning, restoration of drainage patterns, and barricades. These treatments are consistent with Forest Plan direction. By definition, NFTS roads and motorized trails, and other areas not dedicated to growing vegetation, are not considered areas to which Soil Quality Standards are applied. Therefore, any route or area already within the NFTS or brought into the NFTS by any alternative considered in this plan is not subject to the regional or national standards of soil productivity. However, all action alternatives address the need to protect and improve soil resources, and all action alternatives include project design criteria and BMPs to minimize off-site soil movement.

Transportation Facilities

Introduction

This section examines the extent to which alternatives respond to the project’s purpose and need and comply with the Forest Plan and other regulatory direction. Transportation facilities considered in this analysis include roads and motorized trails that are suitable for motor vehicle use decisions regarding changes in the transportation facilities must consider: 1) providing for adequate public safety, and 2) providing adequate maintenance of the roads and motorized trails that will be designated for public use. The analysis in this section focuses primarily on these two aspects of the NFTS.

Analysis Framework: Statute, Regulation, Forest Plan and Other Direction

Direction relevant to the proposed actions as it affects transportation facilities includes:

The Travel Management Rule

Title 36, Code of Federal Regulations, Part 212 (36 CFR 212) is the implementing regulation for the Federal Roads and Trails Act and includes portions of the Travel Management Rule published in the Federal Register on November 9, 2005. Part 212 Subpart A provides criteria for designation of the minimum road system. Part 212 Subpart B provides criteria for designation of roads and trails. Providing public safety and considering the availability of resources for maintenance and administration of roads, trails and areas that would arise if the uses under consideration were designated are two of the criteria of particular interest in this analysis. In addition speed, volume, composition and distribution of traffic on roads, and the compatibility of vehicle class with road geometry and road surfacing were considered by the responsible official were considerations in crafting the actions in the alternatives and responding the public comment.

Forest Service Handbook and Manual

Forest Service Manual §2350 and 7700 contain agency policy for management of the NFTS. The policy requires the development of trail management objectives (TMOs) and road management objectives (RMOs). The TMOs and RMOs document the purpose of each trail or road. The purpose for the trail or road sets the parameters for maintenance standards needed to meet user needs, resource protection and public safety. Forest Service Handbook 7709.58 describes the maintenance management system the Forest Service uses and the maintenance standards needed to meet road management objectives (RMOs) for the road system and include considerations for public safety.

Road maintenance levels define the level of service provided by, and maintenance required for, a specific road. Maintenance levels must be consistent with road management objectives and maintenance criteria. Policy regarding maintenance levels is found in FSH 7709.59, *Road System Operations and Maintenance Handbook*, Chapter 60, §62.3. The following are excerpts from that direction:

> *Roads may be currently maintained at one level and planned to be maintained at a different level at some future date. The operational maintenance level is the maintenance level currently assigned to a road considering today's needs, road condition, budget constraints, and environmental concerns; in other words, it defines the level to which the road is currently being maintained. The objective maintenance level is the maintenance level to be assigned at a future date considering future road management objectives, traffic needs, budget constraints, and environmental concerns. The objective maintenance level may be the same as, or higher or lower than, the operational maintenance level. The*

transition from operational maintenance level to objective maintenance level may depend on reconstruction or disinvestment.

Roads assigned to maintenance levels 2-5 are either constant service roads or intermittent service roads during the time they are open to traffic.

The distinction between maintenance levels 1 and 2 is sharply defined. Maintenance level 1 roads are placed in storage with all vehicular traffic eliminated. Level 2 roads are passable by prudent drivers in high clearance vehicles.

The distinction between maintenance levels 2 and 3 is also sharply defined. Level 2 roads are not maintained to be passable to standard four wheel passenger cars. No provision is made for user comfort, user convenience, and speed of travel. Neither is any provision made to warn users about changing conditions and safety concerns on the road ahead. On the other hand, level 3 roads are passable to prudent drivers in passenger cars. Users can reasonably drive with expectations of predictable road conditions and can expect warning signs and traffic control devices meeting Manual on Uniform Traffic Control Devices standards when hazards are present.

The distinctions between maintenance levels 3, 4, and 5, which are roads managed as public roads (FSM 7730.5), are not sharply defined. Some parameters overlap. Maintenance levels are selected based on the best overall fit of the parameters for the road in question. In those situations where the parameters do not indicate a definite selection, the desired level of user comfort and convenience is the overriding criteria to determine the maintenance level.

Motorized Mixed Use

FSM 7705 defines motorized mixed use as the designation of an NFTS road for use by both highway-legal and non-highway-legal motor vehicles. Regional forester letters, file code 7700/2350, dated August 21, 2006, June 20, 2007, January 13, 2009 and February 12, 2009, contain procedures national forests in Pacific Southwest Region will use to evaluate safety aspects of public travel on roads when proposed changes to the NFTS will allow both highway-legal and non-highway-legal traffic on a road (motorized mixed use).

Regulations at 36 CFR 212.5a make State traffic regulations applicable to NFTS roads. The California Vehicle Code (CVC) regulates the use of motor vehicles in California, including motor vehicles used on the national forests. The CVC sets safety standards for motor vehicles and vehicle operators. It defines the safety equipment needed for highway-legal and non-highway-legal vehicles. It also defines the roads and motorized trails where non-highway-legal motor vehicles may be operated.

The CVC requires motor vehicles operated on highways be highway-legal and be operated by licensed drivers. Region 5 considers passenger car roads (ML 3, 4 and 5) to be subject to state highway law. The CVC allows the operation of non-highway-legal vehicles operated by unlicensed drivers on roughly graded roads. Region 5 considers roads maintained for high clearance vehicles ML 2 as roughly graded and considers operation of OHVs on these roads as consistent with state law.

Maintenance Level 2 (FSM 7709.59 60) is assigned to low standard, high clearance NFTS roads and is to be maintained for use by high-clearance 4WD vehicles rather than passenger travel. Use levels are generally low, consisting of one or a combination of administrative, permitted, dispersed recreation or other specialized uses. Commercial use may occur at this level. Maintenance Level 2 roads have the following attributes:

- Roads have low traffic volume and low speed.
- Typically local roads.
- Typically connect collectors or other local roads.
- Dips are the preferred drainage treatment.
- Not subject to the requirements of the Highway Safety Act.
- Surface smoothness is not a consideration.
- Not suitable for passenger cars.
- Selected UARs are proposed to be designated as ML 2 roads to the NFTS in Alternatives 4-6 as full-size vehicle trails (open to all trail vehicles). The mixed-use designation does not apply to routes designated on the NFTS as motorized trails. Use by non-highway-legal trail vehicles would be allowed on motorized trails.

1995 Six Rivers National Forest Land and Resource Management Plan (Forest Plan)

The Forest Plan transportation facilities direction was established under the implementing regulations of the NFMA and the National Forest Roads and Trails Act (FRTA). The NFTS consists of roads, and trails. The NFTS provides for protection, development, management, and utilization of resources on the national forests. The Forest Plan goals for Motorized Recreation states in part “Provide a range of recreational opportunities to meet the needs of motorized recreationists. Manage motorized recreation to provide for public safety and resource protection, and to reduce user conflict.” (Forest Plan p. IV-123). Additionally the Forest Plan under the standards and guides for motorized recreation states the following: 18-21 – OHV use is restricted to designated routes, and 18-22 – Level 2 roads are open to motorized recreation vehicles (including OHVs), unless otherwise designated closed (Forest Plan p. IV-124).

The Forest Plan goals for transportation and facilities states in part “Provide public access to national forest lands for the use and enjoyment of its natural resources. Provide a safe, efficient and cost-effective transportation system” (Forest Plan p. IV-115). Additionally, the Forest Plan under the standards and guides for transportation and facilities states the following:

- **13-1:** Existing permanent roads not necessary for administrative, recreation, resource protection, commercial and/or public access should be closed after all project work has been completed.

- **13-4:** The permanent transportation system should be maintained to meet the objectives as stated in the annual maintenance program. Correction of existing problems and prevention of future resource damage is the highest priority; and
- **13-5:** Temporary roads will be obliterated and rehabilitated.

Affected Environment

Prior to designation of the Forest Service in 1947, the area developed an extensive mining activity, which included roads for exploration and traveling to and from the mining sites. From around the 1850s, mining has been recorded throughout the Smith River area. Mining began to ramp up in the 1860s for chromite and copper ore at the Low Divide Mine, which was also known as Rowdy Creek or Copper Creek Mine. Other sites included French Hill Mine and High Plateau Mine. Until 1944, Del Norte County was the second largest producer (after San Luis Obispo County) of chromite in California. Production of this mineral, an oxide of chromium and iron, increased dramatically during World War I and World War II due to its importance in manufacturing chrome-steel alloy armaments such as armor plate, projectiles, motors and automobiles.

Many of the roads in place prior to 1947 were developed to areas in and around the Smith River area and Gasquet Ranger District to provide for removal of these minerals and timber with what equipment that was needed for that extraction.

President Harry S. Truman established the SRNF by Presidential proclamation on June 3, 1947. The new forest’s initial 900,000 acres were carved from the western portion of the Klamath and Trinity national forests and the southern portion of the Siskiyou National Forest. The 1947 forest roads *Situation Report* listed only 281 miles of roads that were deemed to be in *satisfactory* condition (Conners 1997). This transportation system was not designed to cope with or promote movement to the coast; instead, most of the forest roads were oriented to sawmills, transportation systems, and markets in Grants Pass and California’s Central Valley. The forest struggled with its marginal and eastward-oriented infrastructure for many years. There were few county and state roads, which were mostly of low standards.

Beginning in the 1950s with the national emphasis on commodity production a concerted effort began to provide a more functional transportation system on the forest was begun. The majority of the national forest roads on the Smith River NRA were constructed and maintained between 1960 and 1990 in support of the timber program. These roads were Forest Service-designed and generally constructed under a timber sale contract by the purchaser. These roads mostly were well located, well designed and well constructed. Most of these roads were typically designed with an outsloped road prism, thereby reducing the concentration of road surface runoff. Typically, until the 1980s, most timber sale roads were surfaced to improve road integrity, reduce road maintenance and provide for a diversity of long-term uses.

In the 1980s, the agency began a shift in emphasis away from commodity outputs to a more holistic approach of resource management. With deficit timber sales in the 1980s and 1990s, road construction standards were modified. Due to high road construction costs surface rocking was used on a site-specific bases. New NFTS roads were outsloped, water barred and spot rocked. Gates or metal barricades were installed as resource mitigations. Many of these roads were high clearance vehicle roads. By the mid to late 1990s, the timber program had stalled and new permanent road construction had ceased except for the occasional short spur needed to access individual timber stands. The majority of arterial and collector system roads were in place. With timber harvest decreased and road maintenance budgets decreased, maintenance of the transportation system became an issue.

Currently, the Smith River NRA has a network of 484 miles of NFTS roads; 12.4 miles of NFTS motorized trails and 155 miles of identified non-system or unauthorized motorized routes within their boundaries. Annual maintenance funding on NFTS roads comes from a variety of sources, including appropriated road maintenance funding (CMRD). The focus of road maintenance funding is on maintenance to provide for safety and resource protection on passenger car roads. This funding also covers road construction, bridge construction and maintenance activities, engineering support for timber sales and stewardship programs. Recently, road maintenance on high clearance roads has been funded with focused project proposal funding such as Resource Advisory Committee (RAC), Capital Investment Projects, and Legacy Roads/Trail appropriations funding. This funding must be competed for, and is more sporadic and site specific in nature.

Transportation system maintenance is accomplished mainly using contracts and to a lesser extent by cooperators, forest service personnel, and volunteers. Funding is also made available from funds generated from timber sales and commercial road access permits, State OHV Division grants, emergency repairs through the ERFO program (emergency repair for federally owned roads), competitive funds such as the Federal Lands Transportation Program, and partnership opportunities. State OHV division grants are also used to fund water quality and botanical resource mitigations required prior to route designation on the NFTS, OHV law enforcement, and decommissioning of roads. In the past, stimulus funds were made available to the forest, but these dollars are not available on a regular basis. Competitive funds for major projects include the proposed repair of a damaged bridge on 18N07, Knopki Creek Road, spanning over Griffin Creek at milepost 0.0.

Major repairs and non-NFTS facilities are funded by special appropriations outside the yearly forest budget. Current and projected funding does not cover deferred maintenance, which means that the deferred maintenance backlog grows annually. Table 3-128 displays funding history. Current trail maintenance funding (both internal and external funding) has been adequate to cover the highest priority trail maintenance needs. Motorized trail maintenance differs from road maintenance in that the use of mechanized equipment is limited due to the narrower width and steeper terrain of most trails.

Table 3-128. Roads and trails funding history for the Six Rivers National Forest.

Year	Roads (CMRD)	Roads (CWFS)	Roads Other	Trails (CMTL)	Trails Other	Total Funds by Year
2009	$1,092,000	$320,000	$734,931	$66,000	$127,537	$2,340,468
2008	$1,028,000	$167,033	$982,181	$149,000	$148,645	$2,475,059
2007	$1,434,000	$283,805	$1,043,435	$77,460	$189,896	$3,028,596
2006	$690,000	$166,000	$0	$191,450	$101,694	$1,423,205
2005	$660,482	$140,000	$413,797	$87,392	$66,565	$1,368,236

Annual maintenance funding on NFTS motorized trails comes primarily from appropriated trail maintenance funding (CMTL) and other sources. Trail maintenance funding is also used to cover all trail construction and all trail bridge construction and maintenance activities. Region 5 has the potential to acquire supplemental funding for motorized recreation through the California Department of Parks and Recreation's Off-Highway Motorized Vehicle Recreation Division Cooperative Agreement Program. Since 2000, the forest has received supplemental state funding to help maintain NFTS motorized trails.

Table 3-129 below displays the estimated average cost per mile to perform annual routine maintenance on existing NFTS roads and motorized trails on the Smith River NRA using the national road maintenance cost spreadsheet. The information for motorized trails was derived using current district costs.

Table 3-129. Average costs for annual road and trail maintenance on the Smith River NRA.

Maintenance Level	Current NFTS Mileage	Annual Cost per Mile	Annual Maintenance Cost
1	90.65	$103	$9,337.16
2	254.33	$593	$150,816.50
3	111.25	$2,355	$261,994.69
4	11.808	$9,078	$107,193.02
5	18.55	$9,078	$168,415.06
Motorized Trail	12.4	$500	$6,200.00
NFTS Roads Total	486.59	--	$697,756.44
NRA NFTS Trails Total	12.4	--	$6,200.00
NRA NFTS TOTAL	***498.99***	***--***	***$703,956.44***

Griffin Creek Bridge

The Griffin Creek Bridge is supported by two concrete abutments on either bank of Griffin Creek, with a mid-span pier support. Twin spread footings embedded into bedrock support each abutment; a single spread footing supports the pier. Three glue-laminated wooden girders support the concrete bridge deck. The southern, downstream-most girder is cracked, compromising the structural integrity and load capacity of the bridge.

During a routine bridge inspection in 2013, it was found that near the southeastern abutment, the downstream girder was cracked, which extended approximately one-third of the length of the girder, compromising the structural integrity and load bearing capacity of the bridge. Temporary mitigation measures were installed, such as *jersey barriers* (also referred to as *K-rails*) and glued pylons, to direct and limit traffic and bridge loading to five tons.

Forest Road 18N07, measuring 13.5 miles, begins at US Highway 199 and is the main access to the upper Knopki Creek watershed, where popular dispersed recreation opportunities exist such as Sanger Lake, Sanger Meadows, and Youngs Valley Trailhead, an equestrian trail providing access to the Siskiyou Wilderness. Forest Road 18N11 provides alternate route to the end of Forest Road18N07; however, this road is an ML 2 road and is designed for high clearance vehicles, not passenger cars. Forest Road 18N07 is an ML 3 road maintained for travel by prudent drivers in a standard passenger car (FSH 7709.58, 10, 12.3).

The bridge's current condition does not support the load bearing requirements necessary to allow trucks with horse-trailers, as well as fire engines or water tenders to cross. The limited capacity of the bridge poses a risk to natural resources by increasing initial attack response times in the event wildfire ignition, and diminishes access to the recreational opportunities on the Smith River NRA. The maintenance and repair of the Griffin Creek Bridge is necessary to allow for safe public and administrative access.

Forest Road 17N49

One road of particular interest in this project is 17N49, which is currently an ML 3 road. This road begins at its intersection with US Highway 199 and ends 7.85 miles to the north at its intersection with County Road 305. Traffic count figures from the October 2014 to August 2015 indicate that the average number of vehicles per day is 7.8. The peak use is in September, during hunting season, at 65 vehicles per day. Table 3-130 displays monthly average vehicle use.

Table 3-130. Average monthly traffic on Forest Road 17N49.

Month	Average Monthly Traffic
January	112.0
February	93.3
March	63.0
April	98.0
May	122.0
June	132.9
July	No Data
August	300.7
September	651.0
October	467.1
November	146.0
December	131.0

Naturally Occurring Asbestos

The California Air Resources Board (CARB) has developed regulations prohibiting the use of serpentine aggregate for road surfacing that has a measurable asbestos content, with the detection threshold set at 0.25 percent (CARB 2000). While no threshold has been set for road surfaces with native NOA surfaces (as opposed to applied serpentinite aggregate), the CARB and US EPA do list dust control measures for unpaved roads that are exempt from the surfacing prohibition due to their remote location (CARB 2002, US EPA 1992). These include: 1) source reduction, such as speed reduction and/or traffic reduction; 2) source improvement such as paving or surfacing with gravel; and 3) surface treatment such as watering and/or chemical stabilization. The exemption also requires permanently posted signage warning of the potential for asbestos exposure. The airborne asbestos dust mitigations proposed in this document align with this direction (see below).

The *Geology* section above discussed that the presence or absence of asbestos, and its concentration, is variable in samples taken in relatively close proximity. In addition, there is no method to reliably predict the concentration of asbestos in the air, given the concentration of a known amount of asbestos in the soil (EPA 2008).

Effects Analysis Methodology

This section focuses on the assumptions, methodology, and indicators for addressing the direct, indirect and cumulative effects of the alternatives in respect to public safety, and maintenance and implementation costs associated with the NFTS.

Transportation Facilities Measurement Indicators

Effects of implementing the alternatives on transportation facilities are evaluated based on public safety and transportation affordability. Transportation affordability is based on the annual maintenance and implementation costs. Direct and indirect measurement indicators for these two elements are described below:

Spatial boundary: The Smith River NRA boundaries are the unit of special analysis.

Short term: 5 years.

Long term: 20 years.

Indicator: Repairs to NFTS structures to ensure public safety – Public Safety

- **Discussion:** This indicator is used to identify investments in NFTS structures, such as bridges, to address risks to public safety. Such actions are necessary to provide for motorist safety while maintaining access to a substantial portion of the forest road network.
- **Analysis Method:** Investment in the NFTS facilities such as the Griffin Creek Bridge and the direct and indirect effects are discussed qualitatively in the effects analysis by alternative.

Indicator: Miles roads, motorized trails, and unbarricaded UARs located on landslides – Public Safety

- **Discussion:** Rock fall and damage to routes as a direct or indirect result of slope instability is a potential physical hazard to motorists. The level of risk for slope instability is mitigated to an extent by several factors. Most landslide terrain is dormant, or if mapped as active, is only episodically active following major storms and other disturbance events such as wildfire. The bulk of landslide activity occurs during the wet winter season when road system usage is light, and many roads are closed seasonally. Therefore, the direct risk from slope failure to motorists is generally low. Slope instability affects the transportation network most by disruption of road network continuity when landslides are activated, potentially rendering portions of the transportation system inaccessible until repairs can be performed.
- **Analysis Method:** These results are derived from the slope stability geo-indicator from the geology analysis located in this chapter.

Indicator: Miles roads, motorized trails, and UARs located on potential naturally occurring asbestos – Public Safety

- **Discussion:** One hazard within the analysis area is the presence of bedrock that may contain naturally occurring asbestos (NOA). Asbestos can pose a health hazard if it is released as dust into the air and inhaled by humans. The potential for exposure during vehicle travel is greatest for riders of all-terrain vehicles, which are open and provide no shielding from the dust, or for riders in multiple passenger vehicles traveling in close proximity with open windows.

- **Analysis Method:** These results are derived from the asbestos hazard geo-indicator from the geology analysis located in this chapter. The Comparison of alternatives by GIS analysis of net length in miles of proposed changes in maintenance levels by one indicator—tabulation of net mileage of proposed roads, motorized trails, and unbarricaded UARs within mapped areas of ultramafic bedrock.

Indicator: Miles of stormproofing investments – Public Safety

- **Discussion:** Stormproofing proposed on existing system roads would enhance slope stability by directing drainage away from unstable areas and from diversion to stream channels, reducing the risk of hillslope, road/stream crossing and stream bank failure, and the associated risk to public safety if such an event were to occur.
- **Analysis Method:** The miles of high and moderate risk roads proposed for stormproofing are summed by alternative.

Indicator: Annual Maintenance and Implementation Costs – Transportation Affordability

- **Discussion:** The affordability indicator provides information for consideration in the process of making changes to the NFTS with respect to the need for maintenance and administration (36 CFR 212.55). Affordability provides a metric on the costs of maintenance that should be performed routinely to maintain the facility to its current standard (annual maintenance) and the costs for maintenance, which has not been completed (deferred maintenance). Additionally there are costs for making changes to the NFTS (implementation costs). Implementation costs are based on estimates for the types of work typically needed to complete the proposed changes to the NFTS. Costs may include safety, resource improvements on the NFTS, and work needed to bring UARs to acceptable standards for use by motor vehicles. These costs may be for improving UARs that will be designated on the NFTS, costs for proposed safety and resource improvements, costs for changing maintenance levels, costs for closing routes to use by motor vehicles, and cost of signing. Other costs such as law enforcement were not analyzed.

  The purpose of the deferred and annual maintenance figures is to capture the costs of the NFTS at a national level, so that national forests can communicate the maintenance funding needs versus funding levels to Congress at a national level. The deferred and annual maintenance figures were generated using a national formula based on random sampling (less than 0.2 percent of system road miles nationwide for 2009) and standard maintenance prescriptions. It is a useful tool for tracking national trends and producing auditable outputs, but was never intended for use at the forest level. The nationally calculated cost figures for ML 2 and 3 roads are based on several assumptions, which include but are not limited to: high cost aggregate surfacing should be replaced and maintained on most level 3 roads; culverts have fixed and relatively limited life spans; ML 2 roads require high numbers of cross drain culverts; and roadside vegetation and debris should be regularly removed from every road.

These assumptions are not specific to the SRNF, and do not apply to many of the forest's roads. The deferred maintenance for the Smith River NRA, in large part includes the types of maintenance activities that affect drivability (brushing, surfacing, pothole repair etc.). Given the conditions on the ground and current maintenance and environmental objectives, the maintenance figures for ML 2 and 3 roads are considered unreasonably high, which artificially inflates the forest's annual and deferred maintenance figures. In this project, roads with a high level of maintenance required, for example have a high number of stream-crossings, are proposed for decommissioning in the action alternatives. In contrast, roads with a low level of maintenance required, for example ridge roads with no stream crossings are proposed to be kept or designated on the NFTS and require less maintenance. The costing models assess all road maintenance needs as the same and do not reflect the consideration that was given to the on-going maintenance needs when crafting the action alternatives.

In crafting the action alternatives, roads and UARs that had a high level of stream crossings and therefore would be expensive to maintain were identified for decommissioning or restoration, while less maintenance intensive that would be more affordable to maintain was proposed for maintaining or designating on the NFTS. Investments such as stormproofing, which make roads more resilient to storm damage, are also an action that is proposed in all action alternatives that, in the long-term, would reduce the amount of maintenance required due to large storm events. The maintenance cycle or frequency at which a road or motorized trail is maintained is based on on-the-ground need for maintenance as identified throughout the year by regular road patrols and road logs. Motorized trail maintenance costs are less per mile to maintain over the long term as there are typically less drainage structures to maintain, however, the cost for the initial implementation of some of the mitigations may be higher as they may be implemented by hand. In the long-term, the forest anticipates that the maintenance costs will be less than the No Action alternative. Annual maintenance and implementation costs for the road system for each alternative are displayed in Table 3-131 and Table 3-132.

Table 3-131. Summary of costs by alternative.

Affordability Measurement Indicators	Alt 1	Alt 4	Alt 5	Alt 6
2A. Annual and Proposed Maintenance Costs of NFTS Roads:				
Subtotal	$703,956.44	$704,316	$601,785	$688,943
2B. Implementation Costs of Design Features:				
Subtotal	$0	$4,380,678	$7,276,894	$5,361,956
Monitoring Costs	$0	$11,105	$11,105	$11,105
Total Estimated cost by Alternative	***$703,956.44***	***$5,096,099***	***$7,889,784***	***$6,062,004***

Table 3-132. Implementation and maintenance costs by alternative.

Affordability Measurement Indicators	Alt 1	Alt 4	Alt 5	Alt 6
Existing NFTS Roads (miles)	486.59	486.59	486.59	486.59
Existing NFTS Trails (miles)	12.4	12.4	12.4	12.4
Net Changes to NFTS Roads (miles)	0	-44.45	-110.2	-36.7
Net Changes to NFTS Trails (miles)	0	66.32	7.39	44.74
2A. Annual and Proposed Maintenance Costs of System:				
Existing/Proposed Annual Maintenance for Roads	$697,756	$664,956	$591,890	$660,373
Existing Annual Maintenance for Trails	$6,200	$6,200	$6,200	$6,200
Proposed Additional Annual Maintenance for Trails	$0	$33,160	$3,695	$22,370
Subtotal	$703,956	$704,316	$601,785	$688,943
2B. Implementation Costs of Design Features:				
UARs added as NFTS motorized trails including costs of mitigations	$0	$102,000	$11,365	$68,810
Gates and/or Barricade Installation	$0	$776,000	$1,030,000	$948,000
Cost of implementing MVUM	$0	$37,800	$37,800	$37,800
Cost of Decommissioning	$0	$2,681,000	$5,517,500	$2,681,500
Parking Sites	$0	$95,878	$8,229	$83,646
Stormproofing	$0	$688,000	$672,000	$632,000
Subtotal	$0	$4,380,678	$7,276,894	$5,361,956
Monitoring Costs	**$0**	**$11,105**	**$11,105**	**$11,105**
Total Estimated Cost by Alternative	***$703,956***	***$5,096,099***	***$7,889,784***	***$6,062,004***
Cost Difference from No Action Alternative	***$0***	***$4,392,143***	***$7,185,828***	***$5,358,048***

Assumptions

- Any motor vehicle use authorized by state law is occurring on the NFTS unless there are forest-specific prohibitions.
- Motor vehicle uses authorized by contracts, permits or other written authorizations are outside the scope of this proposal (i.e. fuel wood gathering, motorized SUP event, residences, mining activities, etc.).
- Vehicle classes eligible for motorized trail use include high-clearance vehicles (4WD etc.). Traffic on NFTS roads generates needs for maintenance. Commercial users are required to perform or pay for maintenance made necessary by their use. Maintenance needs resulting from administrative use and public use are the Forest Service's financial responsibility.
- There is some cost of maintenance that must be borne by the Forest Service for needs generated by natural events, such as rainfall and growth of vegetation, for all routes on the NFTS irrespective of motor-vehicle traffic. The cost of meeting these needs is shared with commercial users and cooperators when such traffic is present.
- State laws regulating motor vehicle equipment and operators set the standard of care for the safety of vehicle operators and other users of the NFTS.
- Maintenance Level 2 roads (ML 2, roads maintained for high clearance vehicles) are already open to mixed use.

- The current season of use for NFTS roads would remain unchanged unless identified on a route specific basis within each alternative.
- It is assumed that most users are prudent drivers, observe the *rules of the road* and practice safe driving techniques.
- The national models cost estimates per mile are greater than project area costs.
- Reduction in risks to road and motorized trails from natural events reduces maintenance needs and costs.
- Low level of use on the project area NFTS contributes to lower maintenance costs.
- In the process of designating motorized trails and roads to the NFTS or making changes to maintenance levels identified hazards and resource risks will be mitigated prior to illustrating on the MVUM.
- Motorized trails and roads open for motorized use will be signed prior to illustrating on the MVUM.

Data Sources

The data sources used for this analysis included the infrastructure database for roads (INFRA), local road data sheets, the Forest Roads Analysis for ML 3 to 5 roads completed in 2003, Smith River RAP completed in 2005, and specialist data sets collected for this travel management plan.

In May 2015, MGE Engineering submitted a review document summarizing the pertinent geologic and geotechnical aspects of the proposed Griffin Creek bridge replacement (MGE Engineering, 2015). This review document was authored by Martin McIlroy and Franklin Taber of Taber Consultants, and incorporates the 1977 Griffin Creek Bridge Site Surface Exploration geotechnical report, authored by Forest Service geotechnical engineer Jon Paulsen.

Data from the INFRA database is used in conjunction with ArcMap and evaluated spatially; however, it should be noted that summary tables have been generated by spatial analysis as well, and as such, may develop rounding errors that reflect in discrepancies in total mileage but is within an acceptable range of tolerance of less than a quarter mile.

Environmental Consequences

Direct and Indirect Effects

Alternative 1 – No Action

Public Safety

Although Griffin Creek Bridge is currently open to single lane traffic in the long term the structural integrity would likely be compromised and closed to motor vehicle traffic restricting motor vehicle access for public use and fire suppression.

Existing hazards would continue to persist without mitigation to reduce risk to public safety associated with travel on roads not maintained from hazards and erodible terrain.

Mixed use is currently occurring on ML 2 roads on the district. There is no history of mixed-use related accidents in the project area. Even with the highest use, the use received on the district is normally light (0 to 25 vehicles per week) on the NFTS roads and trails for minimal risk to travelers.

Affordability – Maintenance and Implementation Costs

No new facilities would be added in this alternative, therefore there would be no additional cost for implementation and no short or long-term direct effects would result. Investments to improve the resiliency of the road network to withstand large storm events would not be made, leaving the NFTS at a higher risk for failure during large storm events.

Effects Common to All Action Alternatives

Public safety

Griffin Creek Bridge

All action alternatives would provide safe, long-term motor vehicle travel across Griffin Creek Bridge by improving the infrastructure beginning with removing the bridge railing for re-use when the deck and curbs are re-established in phase 2; which entails removing and demolishing the concrete deck, glulam girders and steel diaphragm members; and removing and demolishing the offset pier down to the top of the pier footing at ground elevation. The bridge repair is designed so the structure is fully supported from abutment to abutment. The second phase would entail excavating the base of the existing abutments to establish a new center footing to complement the two exterior footings for each abutment. Forms would be constructed to reinforce concrete columns to tie into footings and three steel girders would be installed on abutment seats with new diaphragms between girders. Girders would be painted, formwork for the deck would be constructed and concrete poured to reinforce the deck, with curbs and bridge railings reinstalled.

The repair of the Griffin Creek Bridge on Forest Road 17N07 would provide for safe passage into a large area in the Knopki Creek watershed for recreational users, administrative uses, and fire suppression activities in the long-term. Signing, temporary bridge closure and flaggers would ensure traffic is directed for safe travel in the short-term during construction.

Mixed Use

All action alternatives include downgraded from ML 3 roads to ML 2 two existing NFTS roads in whole or in part (17N07 from milepost 0.0 to milepost10.39 and 17N49 from milepost 2.96 to milepost 7.85), which would allow for motorized mixed use on these segments of road. There is no history of mixed-use related accidents in the project area. Even with the highest use, the use received on the district is normally light (0 to 25 vehicles per week) on the NFTS roads and motorized trails.

The amount of horizontal curves, changes in surface type material, and narrowness of the road width along the alignment pose a higher risk to regular traffic with the addition of OHV traffic. The most southern segment of 17N49 from milepost 0 to milepost 2.96 is not proposed for downgrading to ML 2 given the incompatibility of the road surface type and geometry with the permitted vehicle class. Recreational users and vehicles driving on these roads would be informed of the potential for mixed use on these roads through signage or other educational opportunities to promote safe travel.

Naturally Occurring Asbestos

Asbestiform minerals are naturally occurring fibrous silicate minerals that are commonly associated with ultramafic rock, including serpentinite (Van Gosen 2007). Asbestos exposure has been associated with several forms of lung and esophagus diseases. In order for asbestos to be a public health issue, it must be released as dust into the air and inhaled by a human. The greatest potential risk related to motorized travel occurs when dust is generated by vehicle passage over a native surface that is high in asbestos. Inhalation hazard is particularly high in an open, as opposed to enclosed, vehicle traveling close behind another vehicle, and at higher speeds such as on a mixed-use road on a straight road segment. Where motor vehicle use occurs on ML 2 and motorized trails with native ultramafic rock surfacing, contaminated dust at or below current levels and associated asbestos-related health risks would continue.

Based on the analysis done in the *Geology* section, for all actions, the alternative with the least number of cumulative miles per geo-indicator would have the smallest potential impact on the terrain and/or least potential hazard to human health. Table 3-133 summarizes the difference between alternatives.

Table 3-133. Change in asbestos risk to human health.

	Alternative 1	Alternative 4	Alternative 5	Alternative 6
Action – Designation as NFTS Routes				
Asbestos Hazard	0 miles	58.5	8.8	44.4
Action – Upgrading and Downgrading of Roads (ML 1 and 2)				
Asbestos Hazard	0 miles	-0.6	-14.1	-2.0
Action – Road Decommissioning				
Asbestos Hazard	0 miles	-8.7	-32.1	-8.7
Action – Restoration of Drainage Patterns on UARs				
Asbestos Hazard	0 miles	-35.0	-89.0	-53.5

In light of the uncertainties displayed in the *Geology* section, the proposed mitigation for designating routes in the NFTS that may contain NOA would be to: 1) inform the public of the potential exposure to asbestos; 2) identify the NFTS roads and trails that may present this risk; and 3) impose speed limits on such roads and motorized trails to reduce dust generation and the risk associated with inhaling dust. Additionally, such roads would be posted in the field for lower speeds to reduce dust generation, and identified as having the potential to contain asbestos.

Alternative 4

Public Safety

Alternative 4 would result in a negligible improvement in slope stability, as the risk to slope stability would decrease by two percent. The combined effects of all actions for Alternative 4 represent an increase in potential exposure to naturally occurring asbestos by 5.7 percent. This is largely due to the motorized trails proposed for designation that stem from Forest Road 17N49. The overall level of risk across the analysis area would change little from the existing condition when the risk increase from route designation is weighed against the risk reduction from decommissioning and restoration, although there would be a measurable overall increase in risk related to asbestos exposure.

Alternative 4 includes 112 miles of stormproofing on NFTS roads. The potential for accidents associated with travel on roads maintained from hazards and erodible terrain would be lessened. Stormproofing proposed on existing system roads should further enhance slope stability by directing drainage away from unstable areas and from diversion to stream channels, reducing the risk of hillslope, road/stream crossing and stream bank failure. Alternative 4 provides the highest mileage of stormproofing as it would maintain the greatest number of miles on the NFTS of any alternative.

Affordability – Maintenance and Implementation Costs

The additional estimated costs to implement Alternative 4 would be approximately $4,380,678. New designations on the NFTS would include the 58 miles of motorized trails and 17 miles of roads. Approximately 61 percent of this cost would be to decommission the 54 miles of roads on the NFTS. There would also be the implementation costs of bringing the five parking sites along 17N49, and the newly designated roads and motorized trails to standard. The restoration implementation would include the installation of gates, barriers, and shaping of the UARs and would be approximately $341,153 to implement. Implementation of stormproofing would be approximately $688,000.

Season of use restrictions, decommissioning, downgrading, and stormproofing would reduce the likelihood of water natural event and use related impacts to the NFTS thereby reducing annual maintenance costs below the projected maintenance figures.

Alternative 5

Public Safety

Alternative 5 results in a sizeable reduction in risk to slope stability. The analysis estimates that risk related to slope stability would be reduced by 48 percent. This alternative would also result in a decrease risk of exposure to naturally occurring asbestos by just over 50 percent. While the reductions in the geo-indicator metrics do not necessarily equate to linear ratios of risk reduction, it is evident that this alternative reduces both slope stability hazard and asbestos hazard substantially, especially through the restoration of UARs, and to a greater extent than any of the other alternatives analyzed in detail.

Alternative 5 results in the least number of miles of the NFTS when compared to the other alternatives, therefore investments in stormproofing are not as extensive as in Alternatives 4 and 6, but are proposed to reduce risk to public safety and resources from road failure hazards and erodible terrain. Under Alternative 5, 59 miles of roads would be stormproofed.

Affordability – Maintenance and Implementation Costs

The estimated costs to implement Alternative 5 would be approximately $7,276,894. Approximately 76 percent of this cost would be to decommission the 110.35 miles of roads on the NFTS. The costs to restore UARs would be approximately $579,072 to install gates and barriers, and shape the UARs. Stormproofing costs would be approximately $672,000.

New designations on the NFTS would include 7 miles of motorized trails and 9 miles of roads. This cost would be to develop and distribute the MVUM and replace signs on existing NFTS roads and motorized trails. There would also be the implementation cost of bringing the parking site identified along 17N49. One parking site is proposed along Forest Road 17N49 at the intersection of proposed Motorized Trail 17N49.7 (Spring Road).

Decommissioning, downgrading, stormproofing and season of use restrictions would reduce the likelihood of wheel rutting and water channeling thereby reducing some annual maintenance costs.

Alternative 6

Public Safety

When considering the actions in Alternative 6, the slope stability indicator shows a net decrease in risk by approximately 14 percent. The asbestos geo-indicator illustrates a small decrease in potential exposure to NOA by 8 percent. While the reductions in the geo-indicator metrics do not necessarily equate to linear ratios of risk reduction, it is evident that this alternative reduces both slope stability hazard and asbestos hazard, especially through the restoration and barricading of UARs.

Other investments in the NFTS to reduce risk to public safety and resources include stormproofing of 106 miles of NFTS roads. The potential for accidents associated with travel on roads maintained from hazards and erodible terrain would be lessened.

Affordability – Maintenance and Implementation Costs

The estimated costs to implement Alternative 6 would approximately $5,361,956. Approximately 50 percent of this cost would be to decommission the 54 miles of roads on the NFTS. There would also be the implementation cost of bringing the four parking sites along 17N49 up to standard. New designations on the NFTS would include the 44 miles of motorized trails and 17 miles of roads. Unauthorized routes would be designated on the NFTS as well as the four proposed parking sites on 17N49.

The costs to implement Alternative 6 restoration of UARs would be approximately $398,153, and would include the installation of gates, barriers, and shaping of the UARs. The costs to implement stormproofing would be approximately $632,000.

Season of use restrictions would reduce the likelihood of wheel rutting and water channeling thereby reducing some annual maintenance costs.

Cumulative Effects (Alternatives 4-6)

Public Safety

There would be no significant cumulative effects on public safety in any of the action alternatives. There is no history of mixed-use related accidents in the project area. Even with the highest use, the use received on the districts is normally light (0 to 25 vehicles per week) on the NFTS roads and trails.

Trail signage and maps would be available to inform users of skill level and location, thereby reducing the hazard of being lost or stranded. Maps would be available to search and rescue personnel. Any hazardous intersections with system roads would be identified and corrected. Long term, this would enhance user safety when these motorized routes become part of the managed road systems.

Affordability

Future vegetation management and fuel reduction projects would have a beneficial impact on reducing some annual and deferred maintenance costs on NFTS roads within their project areas. Some of the ongoing and future projects on Smith River NRA that include roads are *Gordon Hill Timber Sale,* the *Hurdygurdy Recreation Improvement* project, the *North Fork Smith River Special Interest Area Road Access*, and the *Big Flat Vegetation and Fuels Management* project.

Summary of Effects Analysis across All Alternatives

The purpose and need is not singularly to reduce maintenance costs, but also to provide for administrative access and a diversity of motorized recreation opportunities, while reducing risk and maintenance costs. These considerations were weighed in developing the alternatives. Table 3-134 displays a summary ranking of effects in respect to risks related public safety and the affordability of the NFTS by alternative.

Table 3-134. Transportation facilities effects summary.

Indicators – Transportation	Rankings of Alternatives for Each Indicator			
	Alt 1	Alt 4	Alt 5	Alt 6
Public Safety[56]	2	1	4	3
Transportation System Affordability	3	1	4	2
Average for Transportation	2.5	1	4	2.5

Alternative 5 is provides the greatest level of risk reduction in respect to public safety by reducing risk to slope stability and potential exposure to NOA. While Alternative 6 decreases risk in both of these analysis areas it does not do so to the extent that Alternative 5 does. Contrarily, Alternative 4 presents the greatest risk to public safety in terms of increasing risk of NOA exposure, and negligible risk reduction to slope stability when compared to the No Action alternative.

While at initial glance it appears that Alternative 5 is the most costly of the alternatives, these costs are near term costs from implementing the decommissioning and restoration work. Over the long-term, Alternative 5 would result in the lowest costs given that estimated annual maintenance costs are $102,000 less than the No Action alternative. Alternative 6 would also result in reduction in annual maintenance costs, however only by $15,000. While alternative 4 has the lowest implementation costs, it has the greatest long-term cost in annual maintenance by increasing these costs by approximately $500.

The forest anticipates there will be a deferred maintenance backlog in the future; however, the forest's annual road maintenance strategy prioritizes public safety and resource risk reduction associated with the NFTS. The forest plans to implement this project over the next 10 to 15 years. The affordability table (Table 3-129) displays the estimated cost to implement the alternative and perform annual maintenance on NFTS roads and trails by alternative. Table 3-128 displays the SRNF's annual available funding for NFTS roads and trails from FY 2005 to FY 2009. Approximately one-quarter of the funding is used for the Smith River NRA.

In FY 2016, there was $44,673 dollars allocated from roads maintenance funds on the Smith River NRA. Table 3-132 shows what the district would need approximately $703,956 dollars to complete all routine maintenance on the existing NFTS, hence a shortfall of $659,283 dollars.

[56] For safety a score of 4 indicates the alternative safest (least risk); a score of 1 indicates the alternative is the least safe (highest risk). For transportation facilities a score of 4 indicates the alternative with the least annual cost; a score of 1 indicates the alternative has the most annual cost (highest cost).

Compliance with Forest Plan and Other Direction

In compliance with travel management regulations at 36 CFR 212.55(a), effects on public safety were considered in the development of the road and trail designations proposed in all action alternatives. For all action alternatives, the continued use of the UARs as either ML 2 roads or motorized trails is determined to be generally safe. This determination is based on the low accident history previously mentioned in this section. Further, it assumes that most users are prudent drivers, observe the *rules of the road*, and practice safe driving.

The Travel Management regulations at 36 CFR 212.55(a) require consideration of the need for and availability of resources for maintenance and administration of designated roads, trails, and areas and conflicts among different classes of motor vehicle uses on NFS lands or neighboring federal lands. Each alternative was evaluated for its environmental effects as well as the recreational opportunities provided to the public, considering the existing roads on forest lands, roads under the jurisdiction of other government entities, and roads connecting to private lands. Consideration of the vehicle class and use on routes beginning and ending led the Forest Service to propose compatible designations for the adjoining route segments on NFS lands.

Naturally Occurring Asbestos

With regard to routes proposed for designation in the NFTS in Alternatives 4, 5, and 6 that are located where naturally occurring asbestos (NOA) may be present, direction from the regional forester (letters of February 11, 2009 and June 30, 2009 cited above) states that public access to and/or recreational use of the national forest that is currently permitted will not be restricted until the actual public health risks associated with NOA are assessed, and that any new proposed activities or projects on the forests that require NEPA would analyze NOA just like any other environmental hazard or concern. The forest is compliant with regional forester direction, because the risk has been analyzed to the extent possible given the current state of knowledge about the distribution of NOA, the potential for exposure and known and unknown levels of risk from exposure.

Given the degree of uncertainty regarding the potential for exposure and the amount of risk involved, the mitigation measures described above would be adopted for each of the action alternatives, namely: 1) informing the public of the potential exposure to asbestos; 2) identifying the NFTS roads and trails that may present this risk; and 3) imposing speed limits on such roads and motorized trails to reduce dust generation and the risk associated with inhaling dust. Additionally, such roads would be posted in the field for lower speeds to reduce dust generation, and identified as having the potential to contain asbestos.

Visual Resources

Introduction

This section examines the extent to which alternatives respond to visual resources management direction established in the Forest Plan and the Travel Management Rule. The Forest Plan visual resources direction was established under the implementing regulations of the NFMA.

In the development of the Forest Plan, the forest's visual resources were inventoried to determine the landscape's scenic attractiveness (Variety Class inventory) and the public's visual expectations (Sensitivity Level inventory). Based upon these inventories, Visual Quality Objectives (VQOs) were established for all forest land areas. The VQOs establish minimum acceptable thresholds for landscape alterations from an otherwise natural-appearing forest landscape. For example, areas with a Retention VQO are expected to retain a natural appearance; areas with a Partial Retention VQO may have some alterations, but they remain subordinate to the characteristic landscape; areas with a Modification VQO can have alterations that do not look natural appearing.

Roads and trails create linear alterations in landscapes that can be mitigated through sound design. Unmitigated, they present uncharacteristic line qualities in forest landscapes. Landscapes with a dense canopy cover have the capability of masking these linear alterations; sparsely covered landscapes have less capability. The proliferation of UARs, particularly in sparsely covered landscapes, can adversely affect the forest's visual resources.

Analysis Framework: Statute, Regulation, Forest Plan, and Other Direction

Direction relevant to the proposed action as it affects visual resources includes:

National Forest Management Act (NFMA)

The NFMA, and its implementing regulations, required the inventory and evaluation of the forest's visual resource, addressing the landscape's visual attractiveness and the public's visual expectations. Management prescriptions for definitive lands areas of the forest are to include VQOs.

Travel Management Rule

The Travel Management Rule does not cite aesthetics specifically, but in the designation trails or areas, the responsible official shall consider effects on forest resources, with the objective of minimizing effects of motor vehicle use.

1995 Six Rivers National Forest Land and Resource Management Plan (Forest Plan)

The Forest Plan contains forest-wide management direction in the form of VQOs and specific management area direction for visual resources. The forestwide goal for visual resources is to "Manage Forest lands to achieve visual quality commensurate with public uses. The Forest will implement a program of visual resource management that will emphasize the maintenance of the undisturbed or near undisturbed character of the landscape within the viewsheds adjacent to heavily used recreation travel routes or use areas" (IV-131). Forest-wide visual standards and guidelines in the Forest Plan applicable to Motorized Travel Management include 17 management areas (MA) identified in the Forest Plan, two of which provide guidelines for this process, MA 13 – Retention and MA 16 – Partial Retention. The goal of MA 13 is to *maintain the area in a natural or near natural appearing condition* (IV-56). The goal of MA 16 is to *maintain the area in a near-natural appearing condition* (IV-62).

Effects Analysis Methodology

This section focuses on the assumptions, methodologies, and indicators used to determine the visual effects of the proposed alternatives. There are three discrete actions common to all action alternatives: 1) The designation of facilities (UARs as motorized trails) to the NFTS, including identifying seasons of use and vehicle class; and 2) Changes to the existing NFTS (including removing facilities from the NFTS, changing maintenance levels of authorized roads and enforcing closures in wet weather by installing and managing gates.); and 3) restoration of UARs.

Forest Service Handbook 462 (USDA 1974) describes the basic landscape management concepts used by the Forest Service for the management of visual resources. The basic visual terminology used to describe landscape character includes form, line, color, and texture. For classification, analysis, and inventory of the visual resource, landscape viewing is identified by the distance zones of foreground (0 to 0.5 miles), middleground (0.5 to 4 miles), and background (4 miles to horizon).

All national forest lands are assigned a VQO. Forest Service Handbook 462 provides a description of the VQOs used for the visual management of lands administered by the forest:

- **Preservation VQO:** Only allows for ecological changes. Management activities, except for very low visual impact recreation facilities are prohibited. (USDA 1974)
- **Retention VQO:** Provides for management activities that are not visually evident. Activities may only repeat form, line, color and texture, which are frequently found in the characteristic landscape. (USDA 1974)
- **Partial Retention VQO:** Activities may be evident, but must remain visually subordinate to the landscape. Activities may also introduce form, line, color, or texture, which are found frequently or not at all in the characteristic landscape but they should remain subordinate to the visual strength of the characteristic landscape. (USDA 1974)
- **Modification:** Management activities may visually dominate the characteristic landscape but should borrow from naturally established from, line, color, or texture. (USDA 1974)

Assumptions Specific to Visual Resources Analysis

- Based upon the review of the Forest Plan, the basic measurement indicator for the visual resources is Compliance with the Retention and Partial Retention VQOs, which are delineated as specific management areas in the Forest Plan.
- New NFTS designations that contribute to the continuity of motor touring will have a beneficial effect on visual resources, since it is assumed that there will be less user-created routes across the landscape.
- Off-highway vehicle use on the Smith River NRA is currently permitted only on designated routes. (Forest Plan, Smith River NRA Management Plan, p.8)
- Maintenance Level 2 roads (ML 2 roads maintained for high-clearance vehicles) are already open to mixed use.
- Maintenance level 1 roads are closed to the public, open for administrative use only.

- Unauthorized routes being proposed as designations on the NFTS have already generated a pre-existing footprint on the visual resource. In many cases, the UARs have been and continue to be used by forest visitors who seek to engage in motorized and non-motorized recreation opportunities, as well as access for cultural uses, fuel wood, gathering, and hunting.
- No motorized trails or roads will be designated within Preservation VQO since this VQO is assigned to wilderness.
- Modification VQO is not analyzed because it allows for alterations such as roads that do not appear natural.
- Proposals for season of use, vehicle class restrictions, and parking and do not cause physical impositions that are permanent on the landscape, and therefore do not affect scenic quality in terms of VQOs.
- Restoration of UARs and road decommissioning promotes natural re-vegetation of the travelway and has a beneficial effect on scenery.
- Routine maintenance of NFTS roads and trails do not affect scenic quality in terms of VQOs.

Data Sources

- Forest Plan for distribution of VQOs and identification of scenic viewsheds.
- *Six Rivers National Forest National Visitor Use Monitoring Results Report FY 2008*.
- GIS layers and associated tabular data sets of the following data: NFTS routes and UARs within each VQO and for each alternative.
- Six Rivers National Forest VQO map used in conjunction with the Forest Plan and the Visual Management System concepts.

Visual Resources Indicators

1. Direct and indirect effects of the designating new facilities and decommissioning roads.

Indicator: The number of miles that are proposed as NFTS within the Retention and Partial Retention VQOs. Direct and indirect effects to the visual resource are evaluated by the extent to which the proposed NFTS falls within the Retention and Partial Retention VQOs.

Short-term timeframe: 1 year.

Long-term timeframe: 20 years.

Spatial boundary: The project area.

Methodology: GIS analysis of proposed designated routes in relation to Retention and Partial Retention VQOs. Input from Resource Specialists who have field reviewed routes.

Rationale: The greater the number of miles of designated NFTS in these VQO equals the greater the degree of visual impact on the viewshed.

2. Direct and indirect effects of restoring drainage patterns on UARs.

Indicator(s): The number of miles of UARS not restored (physically open to motorized vehicles) that occur within the Retention and Partial Retention VQOs. Closure and restoration of UARs would have a beneficial effect on visual resources over the long-term timeframe, and vice-versa those UARs that are not physically closed would continue to degrade scenic resources in the Partial Retention and Retention VQOs. Erosion on UARs would not be mitigated, thereby existing rutting and run-off may visually impact the landscape. The routes would not revegetate or naturalize over time.

Short-term timeframe: 1 year.

Long-term timeframe: 10 to 20 years.

Spatial boundary: The project area.

Methodology: GIS analysis of proposed designated routes in relation to Retention and Partial Retention VQOs. Input from Resource Specialists who have field reviewed routes.

Rationale: Unauthorized routes that are not physically closed are at risk of receiving continued motorized vehicle use, which would deter revegetation and the recovery of the scenic integrity impacted by the UARs. The greater the number of UARs that are not physically closed the greater the impact to Partial Retention and Retention VQOs.

3. Direct and indirect effects of changing maintenance levels and season of use on the existing NFTS.

Indicator(s): Number of key viewsheds that are or have the potential to be adversely affected by motor vehicle travel. Number of key viewsheds that may benefit from route restoration and road decommissioning. Changes to maintenance levels and season of use would have no effect on visual resources, and are therefore not addressed in the *Environmental Consequences* section.

Cumulative Effects

The cumulative effects analysis for the visual resource considers the impact of the alternatives when combined with past, present, and foreseeable future actions. The temporal scope is 10 to 20 years because it is the approximate length of time for natural rehabilitation of UARs.

Short-term timeframe: Not applicable; cumulative effects analysis will be done only for the long-term timeframe.

Long-term timeframe: 10 to 20 years.

Spatial boundary: The viewshed is the unit of spatial analysis for determining cumulative effects.

Methodology: Identify key forest viewsheds (scenic byway corridors, etc.). Identify whether any of these key viewsheds are or have the potential to be adversely affected by motor vehicle travel and number of key viewsheds that may benefit from route restoration and road decommissioning.

Rationale: Compliance with the Retention and Partial Retention VQOs.

Affected Environment

From a visual perspective, Smith River NRA has diverse landscapes with many areas of high scenic quality including the Wild and Scenic Smith River, steep forested mountains, and the Smith River Scenic Byway. The area exhibits tremendous diversity including dense stands of mixed conifers and hardwoods; sparsely vegetated, high elevation plateaus; and high peaks and meadows. Because of this diversity, the Smith River NRA is well suited for a variety of uses.

The scenic qualities of the overall forest have changed over the last 100 years, from an undisturbed appearing landscape to one modified by human activities such as timber harvest and road construction. Wildfires and the historic needs to move goods and people through the landscape have also modified its appearance. Utility lines and mining have affected the undisturbed appearance of the forest to a lesser extent.

Forest scenery and its condition are of high importance to forest visitors. In the 2008 National Visitor Use Monitoring (NVUM) survey, visitors rated the forest scenery condition as good to very good; on a mean scale of importance with 5.0 as highest, scenery was ranked at or above 4.0. During their visits to the forest, viewing natural features was one of the top three recreation activities while driving for pleasure ranked sixth. Table 3-135 displays the existing acreage within each VQO for the project area.

Table 3-135. Project area by visual quality objective (VQO).

VQO	Acres in Project Area	Percent
Preservation	82	00.03%
Retention	44,044.4	16.27%
Partial Retention	60,062.8	22.18%
Modification	166.601.5	62.52%
Total	***270,790.7***	***100.00%***

Environmental Consequences

See the *Effects Methodology* section above regarding how this analysis was conducted. The following tables (Table 3-136 and Table 3-137) display the results of the effects analysis, which are discussed by alternative in the following section.

Table 3-136. Miles of NFTS within retention and partial retention VQOs by alternative.

VQO	Alt 1	Alt 4	Alt 5	Alt 6
Retention	47.6	6.1	2.2	4.9
Partial Retention	0.0	13.7	5.5	10.5
Total	***452.8***	***73.9***	***19.3***	***15.4***

Table 3-137. Miles of proposed UAR restoration within retention and partial retention VQOs by alternative.

VQO	Alt 1	Alt 4	Alt 5	Alt 6
Retention	0	12.6	17.6	14.9
Partial Retention	0	14.8	26	21.1
Total	***0***	***27.4***	***43.6***	***36***

Alternative 1 – No Action

Direct and Indirect Effects

Proposed NFTS in Retention and Partial Retention VQO

No additions to the NFTS would be proposed. This alternative would have a negative effect to visual resources over the long-term timeframe.

Unauthorized Routes Left Physically Open

Since no existing NFTS routes would be decommissioned and no UARs restored, this alternative would have a negative effect to visual resources over the long-term timeframe.

Cumulative Effects

The cumulative effects analysis for the visual resource considers the impact of the alternatives when combined with the following past, present, and foreseeable future actions. Projects with decisions or proposals to decommission roads or designate roads or motorized trails, fuels and vegetation treatment, timber management and vegetation treatment, minerals and geology, special uses and lands management, recreation, fish/wildlife/rare plant management and road/watershed management have been considered. Forest management activities that have the potential for affecting the visual resource, such as vegetation management projects, are expected to comply with visual resource direction in the Forest Plan.

Past activities have formed the current landscape aesthetics and recreation opportunities. Recreation activities and developments, and travel management activities, including the existing NFTS, most often form the viewing platform and opportunities for viewing scenery.

This alternative does not propose any decommissioning of existing NFTS routes nor any restoration of UARs. Cumulatively, the effects of no action along with the past, present, and reasonably foreseeable future actions could result in a more unnatural appearing landscape characteristics resulting in lower VQO ratings that do not meet the Retention or Partial Retention VQO along the forest key viewsheds. Although the majority of the district would continue to have a natural appearance, it is anticipated that the Alternative 1, the No Action alternative, would result in an increase in forestlands that appear altered.

Alternative 4

Table 3-138 displays a summary of Alternative 4's proposed actions within Retention and Partial Retention VQOs.

Table 3-138. Alternative 4 summary of proposed actions within Retention and Partial Retention VQOs.

Alternative 4	Retention Miles	Partial Retention Miles
UARs Added to NFTS:		
UAR to Level 1 Road	0.15	0
UAR to Level 2 Road	2.8	3.9
UAR to Level 3 Road	0.54	0
UAR to Motorized Trail	2.6	9.8
Total	***6.1***	***13.7***
UARs Restored	12.6	14.8
NFTS Decommissioned	4.5	11.4

Direct and Indirect Effects

Proposed NFTS in Retention and Partial Retention VQO

When the number of miles of roads proposed for closure or decommissioning is subtracted from proposed designations to NFTS, the net change within Retention and Partial Retention VQOs is an additional 3.9 miles.

Compared with the other action Alternatives, this Alternative proposes to add the most miles to the NFTS within Retention and Partial Retention VQOs. The proposed routes may be noticeable in the foreground distance zone, but generally, these activities remain subordinate to the characteristic landscape due to topographic and vegetative screening. If and when seen, these routes will typically appear as any other forest road or trail (such as unimproved, natural-surfaced temporary roads or trails that may resemble physically Forest Service ML 1 or 2 roads or motorized trails). When the proposed route intersects existing NFTS roads and trails, the route would be seen briefly by the casual observer traveling the NFTS roads and trails at the posted speed limits. The short duration for observation, in addition to the low development level and quality of the routes, should allow these roadside scenes to meet their prescribed VQO of Retention or Partial Retention.

Unauthorized Routes Physically Left Open

This Alternative proposes restoration of approximately 27.4 miles of UARs within Retention and Partial Retention VQOs. This would have a beneficial effect on visual resources over the long-term timeframe. Erosion on UARs would be mitigated, thereby reducing rutting and run-off that may visually impact the landscape. The routes would revegetate and naturalize over time.

When compared to the other action Alternatives, Alternative 4 proposes to restore the least number of miles of UARs within Retention and Partial Retention VQOs.

Cumulative Effects

See the *Cumulative Effects* section under Alternative 1 for the past, present, and reasonably foreseeable future actions considered.

More motorized routes would be present on the landscape than proposed in the other action alternatives. The UARs proposed as additions already generate a pre-existing footprint on the visual resource. The proposed routes may be noticeable in the foreground distance zone, but generally, these activities remain subordinate to the characteristic landscape due to topographic and vegetative screening. If and when seen, these routes will typically appear as any other forest road or trail (such as unimproved, natural-surfaced temporary roads or trails that may resemble physically ML 1 or 2 roads or motorized trails). When the proposed route intersects existing NFTS roads and trails, the route would be seen briefly by the casual observer traveling the NFTS roads and trails at the posted speed limits. The short duration for observation, in addition to the low development level and quality of the routes should allow these roadside scenes to meet their prescribed VQO of Retention or Partial Retention.

This alternative proposes closure and decommissioning of designated NFTS roads and restoration of designated UARs in Retention and Partial Retention VQOs. This will generally result in a more naturally appearing landscape in the long-term. Other forest management activities that have the potential for affecting the visual resource, such as vegetation management projects, are expected to comply with visual resource direction in the Forest Plan. The majority of the district would continue to have a natural appearance, and the visually impacted areas would continue to rehabilitate, resulting in a more natural-appearing landscape.

Compared with the other action alternatives, this alternative proposes to add the most miles to the NFTS and restore the least number of miles of UARs within Retention and Partial Retention VQOs.

It is anticipated that this alternative along with past, present, and reasonably foreseeable future actions would likely result in minimal to no adverse cumulative effects to visual resources.

Alternative 5

Table 3-139 displays a summary of Alternative 5’s proposed actions within Retention and Partial Retention VQOs.

Table 3-139. Alternative 5 summary of proposed actions within Retention and Partial Retention VQOs.

Alternative 5	Retention	Partial Retention
UARs Added to NFTS:		
UAR to Level 1 Road	0.15	0.9
UAR to Level 2 Road	1.3	0.5
UAR to Level 3 Road	0.54	0
UAR to Motorized Trail	0.2	4.1
Total	***2.2***	***5.5***
UARs Restored	17.6	26
NFTS Decommissioned	4.5	11.4

Direct and Indirect Effects

Proposed NFTS in Retention and Partial Retention VQO

When the number of miles of roads and trails proposed for closure or decommissioning is subtracted from proposed additions to NFTS, the overall change within Retention and Partial Retention VQOs is a reduction of 8.2 miles.

Compared with the other action alternatives, this alternative proposes to add the least number of miles to the NFTS within the Retention and Partial Retention VQOs. As with the other action alternatives, the UARs proposed as additions already generate a pre-existing footprint on the visual resource. The proposed routes may be noticeable in the foreground distance zone, but generally, these activities remain subordinate to the characteristic landscape due to topographic and vegetative screening. If and when seen, these routes will typically appear as any other forest road or trail (such as unimproved, natural-surfaced temporary roads or trails that may resemble physically ML 1 or 2 roads or motorized trails). When the proposed route intersects existing NFTS roads and trails, the route would be seen briefly by the casual observer traveling the NFTS roads and trails at the posted speed limits. The short duration for observation, in addition to the low development level and quality of the routes should allow these roadside scenes to meet their prescribed VQO of Retention or Partial Retention.

Unauthorized Routes Left Physically Open

In comparison to the other action Alternatives, Alternative 5 proposes restoration on the greatest number of miles (approximately 43.6 miles) of UARs within Retention and Partial Retention VQOs. This would have a beneficial effect on visual resources over the long-term timeframe. Erosion on UARs would be mitigated, thereby reducing rutting and run-off that may visually impact the landscape. The routes would revegetate and naturalize over time.

Cumulative Effects

See the *Cumulative Effects* section under Alternative 1 for the past, present, and reasonably foreseeable future actions considered.

When compared with the other action alternatives, this alternative proposes to add the least number of miles to the NFTS within the Retention and Partial Retention VQOs. As with the other action alternatives, the UARs proposed as additions already generate a pre-existing footprint on the visual resource. The proposed routes may be noticeable in the foreground distance zone, but generally, these activities remain subordinate to the characteristic landscape due to topographic and vegetative screening. If and when seen, these routes will typically appear as any other forest road or trail (such as unimproved, natural-surfaced temporary roads or trails that may resemble physically ML 1 or 2 roads or motorized trails). When the proposed route intersects existing NFTS roads and trails, the route would be seen briefly by the casual observer traveling the NFTS roads and trails at the posted speed limits. The short duration for observation, in addition to the low development level and quality of the routes should allow these roadside scenes to meet their prescribed VQO of Retention or Partial Retention.

This alternative proposes decommissioning approximately 15.9 miles roads in Retention and Partial Retention VQO. This would have a beneficial effect on forest visual resources over the long-term timeframe through the natural rehabilitation of former NFTS roads.

This alternative proposes restoration of the greatest number of miles of UARs within Retention and Partial Retention VQOs. Closure and restoration of UARs would have a beneficial effect on visual resources over the long-term timeframe. Erosion on UARs would be mitigated, thereby reducing rutting and run-off that may visually impact the landscape. The routes would revegetate and naturalize over time. It is anticipated that this alternative along with past, present, and reasonably foreseeable future actions would likely result in no adverse cumulative effects to visual resources.

Alternative 6

Table 3-140 displays a summary of Alternative 6’s proposed actions within Retention and Partial Retention VQOs.

Table 3-140. Alternative 6 summary of proposed actions within Retention and Partial Retention VQOs.

Alternative 6	Retention	Partial Retention
UARs Added to NFTS:		
UAR to Level 1 Road	0.15	0.9
UAR to Level 2 Road	2.8	0.4
UAR to Level 3 Road	0.54	0
UAR to Motorized Trail	1.5	9.2
Total	***4.9***	***10.5***
UAR Restored	14.9	21.1
NFTS Decommissioned	4.5	11.7

Direct and Indirect Effects

The Proposed NFTS in Retention and Partial Retention VQO

When the number of miles of roads and trails proposed for closure or decommissioning is subtracted from proposed additions to NFTS, the overall change within Retention and Partial Retention VQOs is a reduction of 0.8 miles.

As with the other action alternatives, the UARs proposed as additions already generate a pre-existing footprint on the visual resource. The proposed routes may be noticeable in the foreground distance zone, but generally, these activities remain subordinate to the characteristic landscape due to topographic and vegetative screening. If and when seen, these routes will typically appear as any other forest road or trail (such as unimproved, natural-surfaced temporary roads or trails that may resemble physically ML 1 or 2 roads or motorized trails). When the proposed route intersects existing NFTS roads and trails, the route would be seen briefly by the casual observer traveling the NFTS roads and trails at the posted speed limits. The short duration for observation, in addition to the low development level and quality of the routes should allow these roadside scenes to meet their prescribed VQO of Retention or Partial Retention.

Unauthorized Routes left physically open

This alternative proposes restoration of approximately 36 miles of UARs within Retention and Partial Retention VQOs. Closure and restoration of UARs would have a beneficial effect on visual resources over the long-term timeframe. Erosion on UARs would be mitigated, thereby reducing rutting and run-off that may visually impact the landscape. The routes would revegetate and naturalize over time.

Cumulative Effects

As with the other action alternatives, the UARs proposed as additions already generate a pre-existing footprint on the visual resource. The proposed routes may be noticeable in the foreground distance zone, but generally, these activities remain subordinate to the characteristic landscape due to topographic and vegetative screening. If and when seen, these routes will typically appear as any other forest road or trail (such as unimproved, natural-surfaced temporary roads or trails that may resemble physically Forest Service ML 1 or 2 roads or motorized trails). When the proposed route intersects existing NFTS roads and trails, the route would be seen briefly by the casual observer traveling the NFTS roads and trails at the posted speed limits. The short duration for observation, in addition to the low development level and quality of the routes should allow these roadside scenes to meet their prescribed VQO of Retention or Partial Retention.

This alternative proposes closure and decommissioning of designated NFTS roads and restoration of designated UARs in Retention and Partial Retention VQOs. This will generally result in a more naturally appearing landscape in the long-term. Other forest management activities that have the potential for affecting the visual resource, such as vegetation management projects, are expected to comply with visual resource direction in the Forest Plan. The majority of the district would continue to have a natural appearance, and the visually impacted areas would continue to rehabilitate, resulting in a more natural-appearing landscape.

It is anticipated that this alternative along with past, present, and reasonably foreseeable future actions would likely result in no adverse cumulative effects to visual resources.

Summary of Effects Analysis across All Alternatives

Table 3-141 summarizes the effect analysis by ranking each alternative regarding how well it addresses the VQOs along key viewsheds. Rankings are scored on a scale of 1 to 5 from greatest (1) to least (5) impact.

Table 3-141. Summary of effects by alternative.[57]

Indicators	Alt 1	Alt 4	Alt 5	Alt 6
Disturbance/Integrity: Compliance with the Retention and Partial Retention VQOs	1	4.5	5	5
Key Viewsheds Affected by Proposed NFTS	1	4	5	4.5
Average for Visual Resources (rank)	1 (1)	4.25 (3)	5 (5)	4.75 (4)

Compliance with the Forest Plan and Other Direction

All action alternatives comply with the Forest Plan and other regulatory direction, although in the long term, Alternative 1 would have the most impacts to the visual resource.

Water Quality

Introduction

Protection of water quality and quantity is an important part of the mission of the Forest Service (Forest Service Strategic Plan for 2007 to 2012, July 2007). Management activities on NFS lands must be planned and implemented to protect the hydrologic functions of forest watersheds, including the volume, timing, and quality of streamflow. The use of roads, motorized trails, and other areas on national forests for public operation of motor vehicles has potential to affect these hydrologic functions through interception of runoff, compaction of soils, and detachment of sediment (e.g., Foltz 2007). Management decisions to designate routes to the NFTS, and make changes to the existing NFTS must consider effects

[57] A score of 5 indicates the alternative is the best for visual resources related to the indicator; a score of 1 indicates the alternative is the worst for visual resources related to the indicator.

on watershed functions. Because these roads, motorized trails and UARs already exist on the landscape, this project will have no effect on water quantity and the remaining analysis is focused on impacts to water quality. The important water quality parameter that most influences the beneficial uses for the affected watersheds is sediment.

This section describes the areas potentially affected by the alternatives and existing resource conditions. This analysis includes twenty 6th-field watersheds located within the Smith River NRA and the forest's Gasquet Ranger District. Mainstem rivers within the analysis area include North, Middle and South Forks of the Smith River.

Analysis Framework: Statute, Regulation, Forest Plan, and Other Direction

Direction relevant to the proposed action as it affects water resources includes:

Clean Water Act of 1948 (as amended in 1972 and 1987)

This act establishes as federal policy the control of point and non-point pollution and assigns the States the primary responsibility for control of water pollution. Compliance with the Clean Water Act by national forests in California is achieved under state law (see below).

Water quality objectives are outlined in the California North Coast Regional Water Quality Control Board's Water Quality Control Plan for the North Coast Region, as adopted by the Water Board on December 9, 1993, including amendments through 2010 (Basin Plan; North Coast Region Water Quality Control Board 2010). The primary purpose for maintaining water quality is to assure that the beneficial uses of water are not adversely affected. The Water Board regulates OHV trails and operations through the waiver process. The Basin Plan for the Smith River contains water quality objectives, implementation plans for meeting those objectives, and other policies of the State Water Quality Control Board and the federal government. There are no total maximum daily loads (TMDLs) listed watercourses in the project area.

Non-point source pollution on national forests is managed through the Regional Water Quality Management Plan (USDA 2011) and national BMPs for water quality management on NFS Lands (USDA 2012) and relies on implementation of prescribed BMPs. All of the applicable BMPs are listed in Appendix D.

The California Water Code

The California Water Code consists of a comprehensive body of law that incorporates all state laws related to water, including water rights, water developments, and water quality. The laws related to water quality (§§13000 to 13485) apply to waters on the national forests and are directed at protecting the beneficial uses of water. Of particular relevance for the proposed action is §13369, which deals with non-point source pollution and BMPs.

The Porter-Cologne Water-Quality Act, as amended in 2006

This act is included in the California Water Code. This act provides for the protection of water quality by the State Water Resources Control Board and the Regional Water Quality Control Boards, which are authorized by the US EPA to enforce the Clean Water Act in California.

1995 Six Rivers National Forest Land and Resource Management Plan (Forest Plan)

The Forest Plan outlines the forest-wide standards and guidelines for water resources. These are augmented by standard and guidelines for each management area. The Forest Plan incorporated the ACS objectives, standards and guidelines from the NWFP. The ACS was developed to restore and maintain the ecological health of watersheds on public lands, and the aquatic ecosystems contained within them. Two important parts of the ACS are riparian reserves and key watersheds. The entire Smith River Basin is designated as a key watershed.

Watershed analysis is required in key watersheds and riparian reserves before determining how the proposed action meets the ACS objectives. A watershed analysis was completed for the Smith River Basin in 1995. The ACS standards and guidelines require that a watershed analysis be completed that determines the influence of each road on ACS objectives, and that roads be designed to minimize impacts on riparian and aquatic resources. No net increase in the amount of NFTS roads is permitted in key watersheds. Designating UARs for use in meadows or wetlands should be avoided. New road-stream crossings should be designed to pass a 100-year-flood event and allow for passage of aquatic fauna.

Effects Analysis Methodology

Common to All Alternatives

The direct and indirect effects analysis area is site-specific and based on existing routes with in the Smith River NRA. The cumulative watershed effects analysis was conducted at the 6th-field watershed level. Twenty 6th-field watersheds were analyzed for cumulative effects.

All past, present and reasonably foreseeable future management activities on public and private lands were assessed at the 6th-field watershed. This includes, for example, wildfires (from 2002 to present), Big Flat and Gordon Hill Vegetation and Fuels Management projects. Timber harvesting, fuel reduction projects and other ground disturbing type activities dating back 30 years were considered in the cumulative watershed effects analysis.

1. Direct and indirect effects of designating facilities (currently UARs) to the NFTS, including necessary mitigations to protect water resources, seasons of use and vehicle class.

Short-term timeframe: 1 year.

Long-term timeframe: 10 to 30 years.

Spatial boundary: Smith River NRA and Gasquet Ranger District boundaries.

Indicator: 1) Miles of routes added by water quality risk rating (low, moderate, high), and 2) number of added route-stream crossings.

Methodology and Assumptions: All routes included in the proposed action were investigated on the ground by qualified earth scientists. Field review of routes documented the number and condition of road-stream crossings, existing road-related erosion, delivery potential and hydrologic connection to stream channels. A water quality risk rating (high, moderate, low) system was developed to summarize the route-specific data collected in the field. The assumption was made that routes in the high or moderate watershed risk rating would continue to have the potential to erode and result in off-site until restorative treatments are applied. Table 3-142 outlines the assumptions and methods used to determine risk to water resources of designating UARs to the NFTS.

Rationale: Published studies (see *References Cited* section) have documented that routes located in riparian reserves or cross-stream channels can negatively impact water quality.

Table 3-142. Assumptions and methods used to determine water quality risk rating of roads and UARs included in the proposed action.

High Risk Characteristics	Moderate Risk Characteristics	Low Risk Characteristics
• Actively eroding (evidence of soil movement). • Sediment delivers to streamcourse. • More than one undersized perennial or intermittent stream crossing culvert with diversion potential. • Not regularly maintained due to road barrier or overgrown travelway.	• More than one undersized spring or ephemeral stream crossing culvert with diversion potential. • No erosion (no evidence of soil movement). • Potential for sediment delivery to streamcourse. • Route is reviewed regularly for road maintenance needs.	• No active road-related erosion (No evidence of soil movement). • No sediment delivery potential to streamcourse. • No stream crossings. • Road is regularly maintained.

2. Direct and indirect effects of changes to the NFTS, including decommissioning roads from the NFTS, changing maintenance levels of roads and adding wet weather road closures.

Short-term timeframe: 1 year.

Long-term timeframe: 10 to 30 years.

Spatial boundary: Smith River NRA and Gasquet Ranger District boundaries.

Indicators: Miles of routes removed by watershed risk rating (high, moderate, low).

Methodology and Assumptions: All routes included in the proposed action were investigated on the ground by qualified Forest Service and private contractor earth scientists. Field review of roads documented the number and condition of road-stream crossings, existing road-related erosion, delivery potential and hydrologic connection to stream channels. A watershed risk rating (high, moderate, low) system was developed to summarize the route-specific data collected in the field. The assumption was made that routes in the high or moderate watershed risk rating would continue to have the potential to erode and result in off-site impacts until restorative treatments are applied. No action includes all NFTS roads and UARs in project area.

3. Direct and indirect effects of active restoration of UARs.

Short-term timeframe: 1 year.

Long-term timeframe: 10 to 30 years.

Spatial boundary: Smith River NRA and Gasquet Ranger District boundaries.

Indicator: Miles of routes restored by water quality risk rating (high, moderate, low).

Methodology and Assumptions: All routes included in the proposed action were investigated on the ground by qualified Forest Service and private contractor earth scientists. Field review of routes documented the number and condition of road-stream crossings, existing road-related erosion, delivery potential and hydrologic connection to stream channels. A water quality risk rating (high, moderate, low) system was developed to summarize the route-specific data collected in the field. The assumption was made that routes in the high or moderate watershed risk rating would continue to erode and result in off-site impacts until restorative treatments are applied.

Cumulative Effects

Short-term timeframe: Not applicable; cumulative effects analysis will be done only for the long-term timeframe.

Long-term timeframe: 10 to 30 years.

Spatial boundary: All 6th-field watersheds that contain unauthorized and NFTS roads on the Smith River NRA. There are 20 6th-field watersheds in the project area. To date, 7th-field watersheds (which are nested in 6th-field watersheds) have not been completely delineated across the forest. Analyzing at the smaller 7th-field scale may give a more refined measure of cumulative effects as it relates to the threshold of concern, however, preliminary results suggest that the cumulative effects at the 6th field watershed scale are well below the threshold of concern.

Indicator: Equivalent roaded areas in acres.

Methodology: The Forest Service in Region 5 has adopted the equivalent roaded acres model as a method of addressing cumulative watershed effects. This model is designed as a preliminary indicator for managers to determine whether past and present land management disturbances in a given watershed approach or exceed a threshold of concern. Acres of management disturbances, such as harvesting, road construction, grazing, and wildfires on public and private lands were tallied for the past 20 to 30 years and assigned an equivalent roaded acreage. Where equivalent roaded acres approach or exceed a given watershed's threshold of concern, further field work would be necessary to ascertain whether cumulative watershed effects are present and if land management activities would adversely add to those effects and result in detrimental impacts to beneficial uses.

Rationale: The equivalent roaded acres cumulative effects model is the standard for Region 5, allows for an evaluation of all land-management activities on NFS lands, and provides for inclusion of reasonably foreseeable future activities.

Affected Environment

The Smith River NRA and Gasquet Ranger District encompass 20 6th-field watersheds (Figure 3-9 and Table 3-143). None of these watersheds are listed as water quality impaired under §303(d) of the Clean Water Act. The Smith River basin is listed as a key watershed.

There are over 650 miles of wild and scenic river designations in the Smith River NRA (Table 3-144) and most support populations of anadromous salmonids.

Table 3-143. Watershed cumulative effects analysis area.

6th-Field Watershed Name	Watershed Acres
Craigs Creek	11,493
Diamond Creek	21,280
Eightmile Creek	15,244
Goose Creek	25,840
Hardscrabble Creek-Smith River	17,784
Hunter Creek	19,103
Hurdygurdy Creek	19,124
Jones Creek	15,740
Lower Middle Fork Smith River	27,288
Lower North Fork Smith River	35,516
Lower South Fork Smith River	27,542
Middle South Fork Smith River	33,097
Patrick Creek	14,775
Rock Creek	10,293
Rowdy Creek	21,826
Siskiyou Fork Smith River	17,501
Smith River-Frontal Pacific Ocean	25,513
Turwar Creek	20,409
Upper Middle Fork Smith River	24,167
Upper South Fork Smith River	28,481

Table 3-144. Existing wild and scenic river land allocations with the project area.

River Designation	Characteristics	Total Stream Miles
Recreational River	Readily accessible by public roads, substantial human modifications to the scenery.	416
Scenic River	Accessible in places by public roads, largely undeveloped, high scenic quality.	69
Wild River	Essentially primitive, little or no evidence of human activity.	167

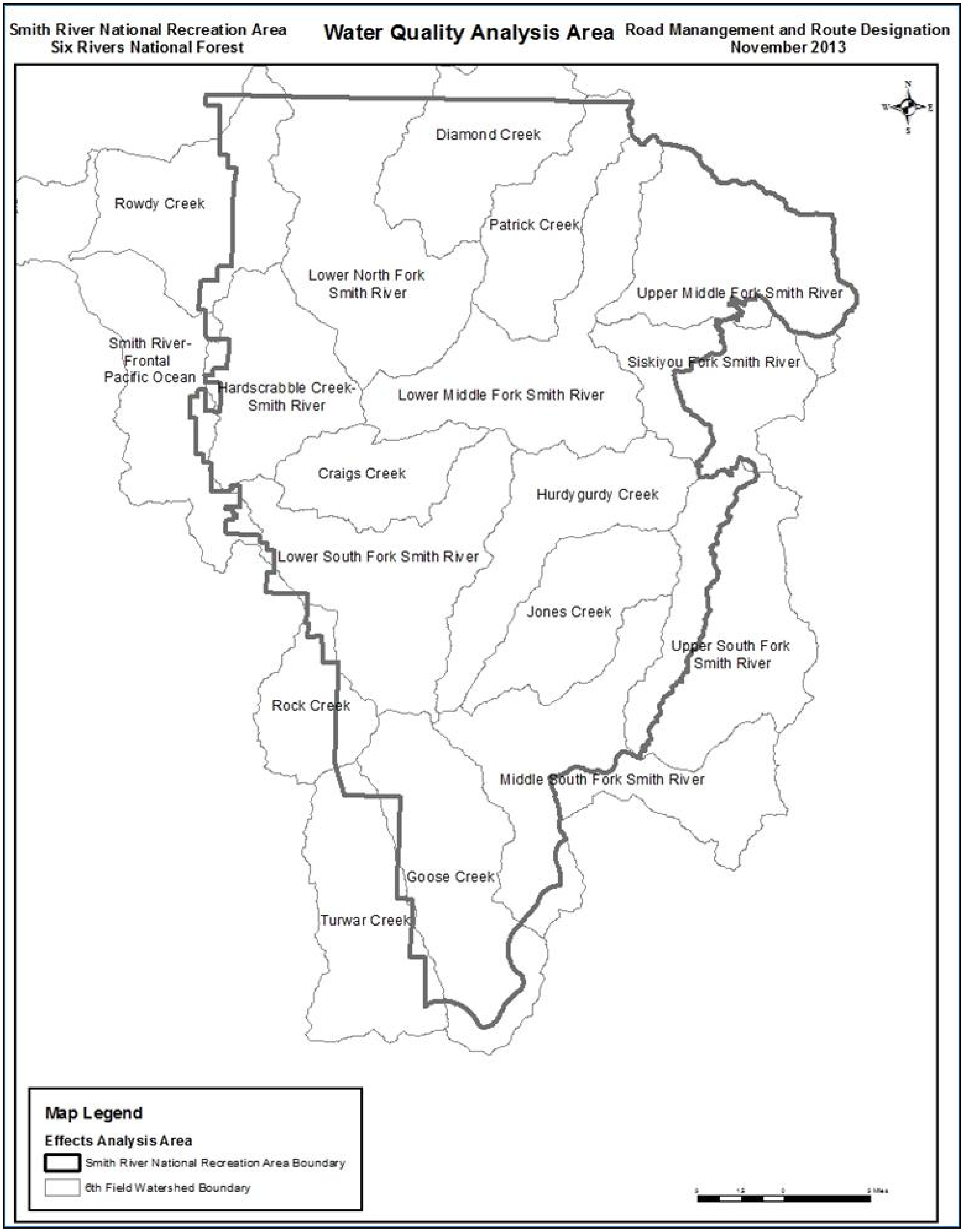

Figure 3-9. Water quality effects analysis boundaries.

Water Resources Risks of NFTS Roads and UARs

Roads within the Smith River NRA are a primary threat to water quality as they are the leading source of management-related sediment inputs to streams (Smith River Watershed Analysis 1995). There are over 340 miles of NFTS roads within the project area and approximately 155 miles of known UARs. Roads have the potential to adversely affect water quality when stream crossings (culverts) plug, fail or divert, resulting erosion and downstream sedimentation of watercourses resulting in substantial water quality risks (Furniss et al. 1997). Roads can intercept rainfall directly on the surface and intercept subsurface water moving down the hillslope; they concentrate flow, either on the surface or in adjacent ditch; and they divert or reroute water from flow paths that it would take were the road not present (Gucinski et al. 2001). The locations of roads determine the degree of potential impacts, making some more environmentally sensitive than others. The closer a route is to a stream channel, the higher the risk of negative effects to that stream. The greatest risk of sediment moving into streams occurs where roads and UARs cross streams.

Road-related erosion and subsequent sediment delivery to channels can increase turbidity and suspended sediment above natural levels and impact aquatic biota and downstream human uses. Road erosion and sediment delivery are typically associated with winter-storm events, where a rapid increase in stream flow can exceed the capacity of culverts and road ditches, resulting in culvert failures, stream diversions, debris slides and road prism slumps. Major winter storms in 1964, 1972, 1977, 1982, 1997 and 2005 all resulted in road and culvert failures and sediment input to streams. Because the mean annual precipitation in the basin varies from 60 to 100 inches in the valley and 90 to 140 inches at higher elevations there is the potential each year for large storm events and road failures to occur.

Maintaining and improving water quality within these watersheds can be accomplished through minimizing future risk of sedimentation from roads by stormproofing needed roads and decommissioning unneeded roads. The water quality risk rating analysis developed for this project revealed approximately 82 percent (251 miles) of existing NFTS roads analyzed pose a low or moderate risk to water quality and 18 percent (57 miles) were rated as high risk.

Unauthorized routes mapped in the project area are a combination of abandoned Forest Service roads, which were primarily intended for temporary use related to timber harvesting or fire suppression activities, exploratory mining routes and user-created cross-country routes. Many of these UARs are native surfaced roads that have no drainage structures other than water bars. Unsurfaced routes that cross streams generally have a higher risk of delivering sediment. The water quality risk rating analysis for all inventoried UARs in the project area revealed approximately 84 percent (130 miles) of UARs in the project area pose a low or moderate risk to water quality, and 16 percent (25 miles) were rated as a high risk.

Environmental Consequences

This analysis is focused on the effects of three actions: 1) designation of UARs to the NFTS, 2) decommissioning of roads from the NFTS, and 3) restoration of routes not designated or on the NFTS. See the *Water Resource Effects Methodology* section above regarding how this analysis was conducted. The alternatives presented below differ in terms of miles of UARs designated on the NFTS. However, there is no difference between alternatives in the amount of routes that currently exist on the ground. Adverse effects of unintended illegal use by vehicles include long-term damage to water resources due to alteration of drainage patterns, stream crossing diversions, and soil compaction along the travelway. Without active restoration (waterbars or road barriers for example), these effects will persist in the near future. However, passive restoration of travel ways is expected following any prohibition of motor vehicle use in the long term.

Direct and Indirect Effects Indicators

Alternative 1 – No action

Indicator: Miles of routes by water quality risk rating (high, moderate, and low).

Routes designated on the NFTS

There are no direct or indirect effects of designating UARs to the existing NFTS because with this alternative, no designations would occur on the NFTS.

Changes to existing NFTS

Under this alternative, no changes would occur. No road decommissioning (this includes decommissioning of NFTS roads) would occur on roads identified as high or moderate risk potential. No downgrading or upgrading of maintenance levels would occur; therefore, no additional mixed-use opportunities would be authorized. Any on-going road-related sediment would continue to have the potential for impacting water quality. Active and potential road-related sediment sources would continue to threaten the water quality in the project area

Risk Mitigations

Under this alternative, no risk mitigations including stormproofing (activities associated with improving road drainage and culvert capacity) would occur on roads identified as high or moderate risk potential. Any on-going road-related sediment would continue to have the potential for impacting water quality. Active and potential road-related sediment sources would continue to threaten the water quality in the project area.

Restoration of UARs

Under Alternative 1 (No Action), the restoration of approximately 52 miles of high and moderate risk UARs would not be implemented. Sediment production from vehicle use of native surfaced routes will likely continue and hydrologically sensitive areas (route-stream crossings) will continue to be impacted. Continued use is not likely to alter peak or low stream flows because the density of these UARs is low and spread across 20 sub watersheds (6^{th}-field). It is difficult to predict where cross-country travel may occur in the future, any attempts to measure effects associated with future proliferation of routes is very speculative. Most forest visitors will stay on existing routes. However, there will be no treatment or mechanism to deter the further proliferation of routes or use in hydrologically sensitive areas.

In the short term (1 year), there would be little recovery of hydrologically sensitive areas, as the UARs would still be accessible. In the long term, (10 to 30 years) some passive recovery would occur in hydrologically sensitive areas, as most forest visitors would obey the rules and not intentionally use UARs; however, there would be no physical barriers installed to insure unintended use would not occur.

Common to All Action Alternatives

Changes to existing NFTS

Downgrading ML 3 to ML 2: Approximately 5 miles of NFTS road 17N49 (Gasquet Mountain Road) and the entire length of 17N07 (Coon Mountain Road) would be downgraded from ML 3 to ML 2. This change in road maintenance level is necessary to facilitate mixed-use activities (suitable for ATVs and high-clearance motor vehicles) for the newly designated motorized trails that are directly accessed from these roads. Downgrading will have no effect to water quality because it would not require any additional ground disturbance that would have the potential to adversely impact water quality. In addition, the overall use of these roads is not expected to sustainably increase because of this designation. Therefore, there would be no direct, indirect or cumulative effects because of downgrading actions.

Alternative 4

Indicator: Miles of routes by water quality risk rating (low, moderate or high).

Routes designated on the NFTS

Of the routes to be designated on the NFTS, 55 miles (73 percent) were rated as low risks to water quality, 14 miles (19 percent) as moderate risks and 6 miles (8 percent) as high risks. Mitigation measures to lessen the impacts to water resources would occur on all high and moderate risk routes proposed for designation on the NFTS. Mitigations include; waterbar installation, culvert replacement, and route delineation (signage or physical barriers to restrict use to only designated routes). All mitigation measures would be completed prior to use by the public. Implementation of these mitigation measures is expected to reduce risk to moderate or low for water quality. Direct and indirect effects in the short term (1 year) are limited. The only new ground disturbance would be the installation of waterbars or culverts to improve drainage and barriers to limit use of designated travel way (route delineation). These activities would occur only on the existing travel way, which is already a disturbed site. In the long term (10 to 30 years) sedimentation is expected to decrease from existing levels because mitigation measures and routine maintenance are expected to promote or enhance hydrologic function in sensitive areas.

Changes to existing NFTS

Decommissioning: Of the miles proposed to be removed from the NFTS, 38 miles (70 percent) were rated as a low risk to water quality, 6 miles (12 percent) as a moderate risk, and 10 miles (18 percent) were rated as a high risk. Roads removed from the NFTS would be decommissioned using heavy equipment. All culverts and associated fill would be removed and stored in stable locations. The travelway may be outsloped or decompacted and motor vehicle barriers will be installed. Because road decommissioning can result in short-term impacts to water quality, mitigation measures such as; mulching, seeding, outsloping, waterbars, rip rap placement, and re-establishment of natural drainage pathways (channel bottom widths and side slope gradients match the surrounding topography) would be implemented where appropriate. Long-term benefits will take effect once the treatment sites have recovered and stabilized (Switalski 2004). Based on studies conducted on the forest, the amount and duration of direct and indirect sedimentation impacts associated with road decommissioning post treatment erosion is estimated to be about 1 to 3 percent of the total fill volume excavated over a 5-year period (Furniss, Clifton and Ronnenberg 2007). In the long term (10 to 30 years) sedimentation is expected to decrease from existing levels because decommissioning actions are expected to promote or enhance hydrologic function in sensitive areas.

Downgrade to Maintenance Level 1: Of the NFTS roads proposed for downgrading to ML 1 approximately 17 miles (55 percent) were rated as a low risk to water quality, 6 miles (19 percent) as a moderate risk, and 8 miles (26 percent) as a high risk. Treatments for ML 1 roads would include installation of a road barricade that restricts motor vehicle traffic and stored in a maintenance free condition. Maintenance free condition could require only minor work on the road prism, similar to water bars or rolling dips, to measures such as culvert removal. The goal is to leave the road in a condition that would not require annual maintenance and ensure no adverse impacts to water quality would occur because of the road storage activity. Post-treatment impacts (short and long term) and recovery rates would be the similar as those described above in road decommissioning.

Upgrade Maintenance Level: Most of the roads (89 percent) proposed for upgrading to level 2 pose a low risk to water quality. The remaining roads have the potential to impact water quality and therefore, would have specific project design features (repair/replace stream crossing culverts, install rolling dips to promote positive drainage) incorporated into the proposed action. The project design features reduce the risk to moderate or low levels because the actions are intended to reduce the amount of fine sediment that may be delivered to streams from road surface erosion, mass wasting, or stream channel diversions.

Risk Mitigations

Stormproofing: There are approximately 111 miles of NFTS roads and motorized trails that are recommended for stormproofing. Approximately 64 miles (57 percent) were rated as a moderate risk to water quality and 47 miles (43 percent) as a high risk. Stormproofing includes actions that are intended to improve the roads resiliency to withstand larger storm events. Common treatments include installing larger diameter culverts at stream crossings; and constructing rolling dips, outsloping or spot rocking the travelway. Stormproofing activities are expected to reduce the amount of fine sediment that is delivered to streams from surface erosion. Stormproofing actions are also expected to reduce the likelihood and impacts of mass-wasting events through reducing the potential for stream channel diversion by replacing undersized culverts and improving road surface drainage. All activities would occur within the existing travelway; no new ground disturbance is expected. Because work would be conducted on existing roads, the amount and duration of adverse effects to water quality are expected to be minor and short-term. In the long term, the potential for road-related sedimentation because of these activities are expected to be reduced because the overall hydrologic function of treated roads would be improved.

Restoration of UARs

This alternative includes actions that would restore the hydrologic function of UARs not designated for motorized travel. Of these miles to be restored, approximately 14 miles (21 percent) were rated as a low risk to water quality, 37 miles (56 percent) as a moderate risk, and 15 miles (23 percent) as a high risk. Restoration actions include placing vehicle barriers, installing waterbars and culvert removal. Route-stream crossings would be treated to improve overall hydrologic function and restore more natural drainage patterns. Short and long-term effects of these actions are the same as discussed above (roads decommissioned), with the exception that not all UARs under this action would be barricaded. Passive restoration would be presumed as the routes would not be placed on the MVUM and are not authorized for motor vehicle use. Without active restoration (waterbars or road barriers for example), these effects will persist in the near future. However, passive restoration of travel ways is expected following any prohibition of motor vehicle use in the long term.

Alternative 5

Indicator: Miles of routes by water quality risk rating (low, moderate or high).

Routes designated on the NFTS

Alternative 5 will designate approximately 17 miles of UARs. Of these routes designated, 10 miles (61 percent) were rated as low risk to water quality, three miles (15 percent) as moderate risk, and four miles (23 percent) as high risk.

Mitigation measures to lessen the impacts to water resources would occur on all high and moderate risk routes proposed for addition to the NFTS. Mitigations include waterbar installation, culvert replacement, signage and route delineation. All mitigation measures would be completed prior to use by the public. Implementation of these mitigation measures is expected to reduce ratings from moderate to low risks to water quality. Direct and indirect affects in the short term (1 year) are limited. The only new ground disturbance would be the installation of waterbars to improve drainage and route delineation. These activities would occur only on the existing travel way, which is already a disturbed site. In the long term (10-30 years) sedimentation is expected to decrease from existing levels because mitigation measures and routine maintenance are expected to promote or enhance hydrologic function in sensitive areas.

Changes to existing NFTS

Decommission: Alternative 5 proposes to decommission approximately 110 miles of road from the NFTS. Of these, approximately 51 miles (46 percent) were rated as a low risk to water quality, 28 miles (26 percent) as a moderate risk, and 31 miles (28 percent) high risk. Roads decommissioned from the using heavy equipment. All culverts and associated fill would be removed and stored at stable locations. The travelway may be outsloped or decompacted and motor vehicle barriers will be installed. Because road decommissioning can result in short-term impacts to water quality, mitigation measures such as: mulching, seeding, outsloping, waterbars, rip rap placement, and re-establishment of natural drainage pathways (channel bottom widths and side slope gradients match the surrounding topography) would be implemented where appropriate. Long-term benefits will take effect once the treatment sites have recovered and stabilized (Switalski 2004). Based on studies conducted on the forest, the amount and duration of direct and indirect sedimentation impacts associated with road decommissioning post treatment erosion is estimated to be about 1 to 3 percent of the total fill volume excavated over a 5-year period (Furniss, Clifton and Ronnenberg 2007). In the long term (10 to 30 years), sedimentation is expected to decrease from existing levels because mitigation measures and routine maintenance are expected to promote or enhance hydrologic function in sensitive areas.

Downgrade to Maintenance Level 1: Approximately 55 miles of NFTS roads would be downgraded to ML 1. Of these roads, approximately 23 miles (42 percent) were rated as a low risk to water quality, 25 miles (46 percent) as a moderate risk, and 7 miles (12 percent) were rated as a high risk to water quality. Treatments for ML 1 roads would include installation of a road barricade that restricts all motor vehicle traffic and stored in a maintenance free condition. Maintenance free condition could require only minor work on the road prism, similar to water bars or rolling dips, to measures such as culvert removal. The goal is to leave the road in a condition that would not require annual maintenance to ensure no adverse impacts to water quality would occur because of the road storage activity. Post-treatment impacts (short and long term) and recovery rates would be the same as those described above for roads decommissioned.

Upgrade Maintenance Level: Of the roads (4 miles) proposed for upgrading to ML 2 pose a low risk to water quality. The other roads have the potential to impact water quality and therefore, would have specific project design features (repair/replace stream crossing culverts, install rolling dips to promote positive drainage) incorporated into the proposed action. The project design features reduce the risk to moderate or low levels because the actions are intended to reduce the amount of fine sediment that may be delivered to streams from road surface erosion, mass wasting, or stream channel diversions.

Risk Mitigations

Stormproofing: There are approximately 59 miles NFTS roads and motorized trails that are recommended for stormproofing to reduce the risk to water quality from high to moderate or low levels. About 36 miles (62 percent) were rated as a moderate risk to water quality and 22 miles (38 percent) as a high risk.

Stormproofing includes maintenance actions that are intended to improve road and motorized trail resiliency to withstand larger storm events. Common treatments include installing larger diameter culverts at stream crossings, constructing rolling dips, outsloping and spot rocking the travelway. Road stormproofing activities are expected to reduce the amount of fine sediment that is delivered to streams from surface erosion. These activities are also expected to reduce the likelihood and impacts of mass-wasting events through reducing the potential for stream channel diversion, replacing undersized culverts, and improving road surface drainage. All activities would occur within the existing travelway; no new ground disturbance is expected. Because work would be conducted on existing roads, the amount and duration of adverse effects to water quality are expected to be minor and short-term. In the long term, the potential for road-related sedimentation because of these activities are expected to be reduced because the overall hydrologic function of treated roads would be improved.

Restoration of UARs

This alternative includes action that would restore the hydrologic function of UARs not designated for motorized travel. Of these miles to be restored, 96 miles (73 percent) were rated as a low risk to water quality, 23 miles (17 percent) as a moderate risk, and 14 miles (10 percent) as a high risk. Restoration actions include placing vehicle barriers, installing waterbars and culvert removal. Route-stream crossings would be treated to improve overall hydrologic function and restore more natural drainage patterns. Short and long-term effects of these actions are the same as discussed above for roads decommissioned.

Alternative 6

Indicator: Miles of routes by water quality risk rating (low, moderate or high).

Routes designated on the NFTS

Alternative 6 would designate approximately 61 miles of UARs to the NFTS. Of these, approximately 44 miles (73 percent) were rated as low risks to water quality, 11 miles (18 percent) as moderate risks and 6 miles (9 percent) as high risks.

Mitigation measures to lessen the impacts to water resources would occur on all high and moderate risk routes proposed to be added to the NFTS. Mitigations include waterbar installation, culvert replacement, signage and route delineation. All mitigation measures would be completed prior to use by the public. Implementation of these mitigation measures is expected to reduce the risk to water quality to moderate or low levels. Direct and indirect affects in the short term (1 year) are limited. The only new ground disturbance would be the installation of waterbars to improve drainage and route delineation since the routes already exist on the landscape. These activities would occur only on the existing travel way, which is already a disturbed site. In the long term (10 to 30 years), sedimentation is expected to decrease from existing levels because mitigation measures and routine maintenance are expected to promote or enhance hydrologic function in sensitive areas.

Changes to existing NFTS

Decommission: Alternative 6 proposes to decommission approximately 54 miles of road from the NFTS. Of these to be removed; approximately 37 miles (68 percent) were rated as a low risk to water quality, 7 miles (13 percent) as a moderate risks, and 10 miles (19 percent) as a high risks. Roads removed from the NFTS would be decommissioned using heavy equipment. All culverts and associated fill would be removed and stored at stable locations. The travelway may be outsloped or decompacted and motor vehicle barriers will be installed. Because road decommissioning can result in short-term impacts to water quality, mitigation measures such as; mulching, seeding, outsloping, waterbars, rip rap placement, and re-establishment of natural drainage pathways (channel bottom widths and side slope gradients match the surrounding topography) would be implemented where appropriate. Long-term benefits will take effect once the treatment sites have recovered and stabilized (Switalski 2004). Based on studies conducted on the forest, the amount and duration of direct and indirect sedimentation impacts associated with road decommissioning post treatment erosion is estimated to be about 1 to 3 percent of the total fill volume excavated over a 5-year period (Furniss, Clifton and Ronnenberg 2007). In the long term (10 to 30 years), sedimentation is expected to decrease from existing levels because mitigation measures and routine maintenance are expected to promote or enhance hydrologic function in sensitive areas.

Downgrade to Maintenance Level 1: Approximately 36 miles of NFTS roads would be designated to ML 1 status. Of these miles, 11 miles (31 percent) were rated as low risks to water quality, 12 miles (33 percent) as a moderate risk and 13 miles (36 percent) as high risk. Treatments for ML 1 roads would include installation of a road barricade that restricts all motor vehicle traffic and stored in a maintenance free condition. Maintenance free condition could require only minor work on the road prism, similar to water bars or rolling dips, to measures such as culvert removal. The goal is to leave the road in a condition that would not require annual maintenance to insure no adverse impacts to water quality would occur because of the road storage activity. Post-treatment impacts (short and long term) and recovery rates would be the same as those described above for roads decommissioned.

Risk Mitigations

Stormproofing: There are approximately 106 miles of roads and motorized trails recommended for stormproofing to reduce the risk to water quality from high to moderate or low levels. Approximately 60 miles (56 percent) were rated as a moderate risk to water quality and 46 miles (44 percent) as a high risk.

Stormproofing includes maintenance actions that are intended to improve road and motorized trail resiliency to withstand larger storm events. Common treatments include installing larger diameter culverts at stream crossings, constructing rolling dips, outsloping and spot rocking the travelway. Road stormproofing activities are expected to reduce the amount of fine sediment that is delivered to streams from surface erosion. These activities are also expected to reduce the likelihood and impacts of mass-wasting events through reducing the potential for stream channel diversion, replacing undersized culverts, and improving road surface drainage. In addition, routine maintenance activities would occur on all NFTS roads and motorized trails. Routine maintenance includes culvert and ditch cleaning, blading and grading of travel way, clearing and trimming of vegetation in travelway. All activities would occur within the existing travelway; no new ground disturbance is expected. Because work would be conducted on existing roads, the amount and duration of adverse effects to water quality are expected to be minor and short-term. In the long term, the potential for road-related sedimentation because of these activities are expected to be reduced because the overall hydrologic function of treated roads would be improved.

Restoration of UARs

This alternative includes actions that would restore the hydrologic function of 93 miles of UARs not designated for addition to the NFTS. Of these miles to be restored, 58 miles (63 percent) were rated as a low risk to water quality, 19 miles (20 percent) as a moderate risk, and 16 miles (17 percent) as a high risk. Restoration actions include placing vehicle barriers, installing waterbars and culvert removal. Route-stream crossings would be treated to improve overall hydrologic function and restore more natural drainage patterns. Short and long-term effects of these actions are the same as discussed above for roads decommissioned.

Cumulative Watershed Effects

In assessing cumulative watershed effects for this project, all past and present and reasonably foreseeable actions on both public and private lands were assessed within all affected watersheds and related to beneficial uses and sensitivities within these watersheds (Forest Plan p. IV-71). The equivalent roaded acres model was used as a method of addressing cumulative watershed effects. This model is designed as a preliminary indicator for managers to determine whether past and present land management disturbances in a given watershed approach or exceed a threshold of concern. The threshold of concern is an estimated upper limit of total disturbance that a watershed can tolerate without adverse impacts to beneficial uses. Anadromous fisheries are the primary beneficial use in the project area and increased sediment delivery to streams may impact anadromous fish habitat. More information about the equivalent roaded acres model can be found in Appendix E (Cumulative Watershed Effects Analysis, Assumptions and ERA coefficients used in the Travel Management Assessment). The timeframe for the analysis is the past 30 years and into the future 10 years. Figure 3-9 (above) displays the watershed cumulative effects boundaries.

Activities that contribute equivalent roaded acres in the project area are timber harvesting, road construction, mining and wildfires. The Smith River NRA Management Plan was adopted in 1992, and since then timber harvesting and road construction has been dramatically reduced. Mining for chromite, nickel and gold began around 1850 and peaked about 1865. World War II sparked some new mining claims, but the few remaining claims are no longer active. Mine reclamation in the North Fork Smith River watershed has been ongoing for several years and will continue to be a high priority for the forest. Since 1998, wildfires have burned over 100,000 acres in the project area. The Biscuit Fire in 2002 and the Gasquet Complex in 2015 accounts for the majority of these acres. The portion of the Biscuit fire located on the Smith River NRA was confined to the North Fork and Lower Middle Fork Smith River watersheds. Fire intensity was primarily low to moderate with some patches of higher intensity. The Gasquet Complex was located in the South Fork Smith and Blue Creek watersheds. Fire intensity was largely very low/unburned to low (73 percent of all acres in the fire perimeters). As in the case of all the wildfires since 1998, no emergency soil stabilization actions were necessary.

All of the roads and UARs associated with this project already exist on the landscape and are reflected in the total percent existing equivalent roaded acres. Because these roads and motorized trails already exist on the ground and changes to maintenance levels or motorized trail additions are already accounted for in the percent existing equivalent roaded acres, the only changes to the projects contribution to the total equivalent roaded acres will be associated with UAR restoration and road decommissioning. The primary purpose of UAR restoration and decommissioning actions are to restore hydrologic function of roads and UARs. Subsequently, the percent equivalent roaded acres associated with these actions will be subtracted from the existing percent equivalent roaded acres. Professional judgment and experience concerning hydrologic recovery rates of roads and UARs restored on the forest conclude that it may take 10 years for hydrologic functions to be restored. Equivalent roaded acres associated with future management actions will be added to each watersheds cumulative equivalent roaded acres.

Based on the cumulative effects analysis and watershed assessments of past and current conditions, lands within the Smith River basin have not experienced levels of human disturbance that change ecological processes or impact conditions over the long term (USDA Forest Service, Ecosystem Analysis of the Smith River 1995). However, there are some impacts from the floods of 1955 and 1964 are still reflected in stream channel conditions. Future road decommissioning and UAR restoration efforts are essential for maintaining current stream channel conditions and promoting the continuing recovery these important anadromous watersheds.

Table 3-145 summarizes the current percent equivalent roaded acres for the project area and compares it to each watershed's threshold of concern. None of the watersheds in the analysis area are approaching the threshold of concern.

Table 3-146 displays the percent equivalent roaded acres for Alternative 1 (No Action) and Alternative 6 (the preferred alternative). Table 3-147 compares the cumulative percent equivalent roaded acres for all alternatives. The No Action alternative accumulates, in the long term, more equivalent roaded acres when compared to all other alternatives.

None of the alternatives would move any analysis watershed to the threshold of concern because the routes are spread over such a large area (roughly 360,000 acres). The magnitude of observed effects is small as are the geographic extent of the impacts. The duration and frequency of motorized use are annual in nature and repetitive. Many roads and all motorized trails are subject to wet weather closures. Because the magnitude and spatial extent of the effects are small, the repeated nature of motorized use impacts does not translate into significant cumulative watershed effects that put the affected watersheds over the threshold of concern.

Table 3-145. Existing percent equivalent roaded acres (ERAs) compared to the threshold of concern by watershed.

6th-Field Watershed Name	Existing Percent ERA	Percent Threshold of Concern
Craigs Creek	3.69	10.0
Diamond Creek	6.41	12.9
Eightmile Creek	0.33	13.1
Goose Creek	2.72	11.7
Hardscrabble Creek-Smith River	3.51	10.0
Hunter Creek	1.86	13.1
Hurdygurdy Creek	1.86	11.9
Jones Creek	1.25	12.1
Lower Middle Fork Smith River	2.52	10.0
Lower North Fork Smith River	3.18	10.0
Lower South Fork Smith River	1.67	11.6
Middle South Fork Smith River	2.96	10.7
Patrick Creek	2.76	12.9
Rock Creek	1.56	11.7
Rowdy Creek	4.93	10.5
Siskiyou Fork Smith River	1.36	11.4
Smith River-Frontal Pacific Ocean	1.47	12.7
Turwar Creek	0.38	11.7
Upper Middle Fork Smith River	2.14	11.8
Upper South Fork Smith River	0.48	12.7

Table 3-146. Cumulative effects – Alternative 6 equivalent roaded acres (ERAs) compared to Alternative 1.

6^{th}-Field Watershed Name	Percent ERAs Reduced Alternative 1	Percent ERAs Reduced Alternative 6	Future Planned Actions Added to Percent ERAs	Alternative 6 Cumulative Percent ERAs (reduced + future ERAs)
Craigs Creek	0	0.003	1.410	5.098
Diamond Creek	0	0.002	0	6.405
Eightmile Creek	0	0	0	0.332
Goose Creek	0	0.002	0	2.720
Hardscrabble Creek-Smith River	0	0.004	0.090	3.595
Hunter Creek	0	0	0	1.859
Hurdygurdy Creek	0	0.002	0.180	2.035
Jones Creek	0	0.001	0	1.251
Lower Middle Fork Smith River	0	0.002	0.026	2.541
Lower North Fork Smith River	0	0.002	0	3.179
Lower South Fork Smith River	0	0.002	0.180	1.850
Middle South Fork Smith River	0	0.002	0	2.961
Patrick Creek	0	0.003	0	2.754
Rock Creek	0	0	0	1.558
Rowdy Creek	0	0.003	0	4.922
Siskiyou Fork Smith River	0	0.003	0	1.354
Smith River-Frontal Pacific Ocean	0	0	0	1.474
Turwar Creek	0	0	0	0.378
Upper Middle Fork Smith River	0	0.004	0	2.129
Upper South Fork Smith River	0	0.001	0	0.480

Table 3-147. Comparison of cumulative percent equivalent roaded acres (ERAs) for all alternatives.

6^{th}-Field Watershed Name	Cumulative Percent ERAs			
	Alternative 1	Alternative 4	Alternative 5	Alternative 6
Craigs Creek	5.101	5.099	5.098	5.098
Diamond Creek	6.404	6.402	6.402	6.405
Eightmile Creek	0.332	0.332	0.332	0.332
Goose Creek	2.722	2.721	2.720	2.720
Hardscrabble Creek-Smith River	3.598	3.593	3.591	3.595
Hunter Creek	1.859	1.859	1.859	1.859
Hurdygurdy Creek	2.037	2.035	2.035	2.035
Jones Creek	1.252	1.251	1.251	1.251
Lower Middle Fork Smith River	2.543	2.542	2.541	2.541
Lower North Fork Smith River	3.181	3.180	3.177	3.179
Lower South Fork Smith River	1.852	1.850	1.849	1.850
Middle South Fork Smith River	2.963	2.961	2.960	2.961
Patrick Creek	2.757	2.755	2.754	2.754
Rock Creek	1.558	1.558	1.557	1.558
Rowdy Creek	4.925	4.922	4.921	4.922
Siskiyou Fork Smith River	1.356	1.354	1.354	1.354
Smith River-Frontal Pacific Ocean	1.474	1.473	1.474	1.474
Turwar Creek	0.378	0.378	0.377	0.378
Upper Middle Fork Smith River	2.133	2.129	2.127	2.129
Upper South Fork Smith River	0.481	0.480	0.480	0.480

Summary of Effects Analysis across All Alternatives

Comparison of water quality indicators in the table (Table 3-148) below reveals that there is not a significant difference concerning impacts to water quality in all of the action alternatives. However, because all of the roads and routes analyzed already exist on the ground, some effects to water quality have already occurred. The main difference between all the action alternatives is the amount of UAR restoration and road decommissioning proposed. While these activities (restoration and decommissioning) generally produce the same results on the ground, they are differentiated based on whether or not the travel route is already a designated system road or is currently an UAR. It is important to understand that both of these actions would prohibit motorized vehicle use.

Alternative 5 predicts the least impacts and greatest potential for water quality protection because it proposes more road decommissioning and restoration of UARs. Alternative 6 also provides for greater protection of water quality as compared to Alternatives 1 and 4. Table 3-148 clearly displays Alternative 1 (No Action) as having the most impact to water quality because it maintains the status quo and does not provide for active road restoration, decommissioning or stormproofing.

When considering the full array of proposed actions, Alternatives 1 and 4, predict greater impacts to water quality and Alternatives 5 and 6 lesser impacts. Implementation of any of the action alternatives will be an improvement over the current condition.

Table 3-148. Comparison of effects to water quality.

Indicators	Rankings of Alternatives by Indicator[58]			
	Alt 1	Alt 4	Alt 5	Alt 6
Miles of UARs designated on the NFTS measured by water quality risk rating (low, moderate, high).	0	75 total (55 Low, 14 Mod, 6 High)	17 total (10 Low, 3 Mod, 4 High)	61 total (44 Low, 11 Mod, 6 High)
Miles of NFTS road decommissioned measured by water quality risk rating (low, moderate, high).	0	54 total (38 Low, 6 Mod, 10 High)	110 total (51 Low, 28 Mod, 31 High)	54 total (37 Low, 7 Mod, 10 High)
Miles of road and motorized trail stormproofed measured by water quality risk rating (low, moderate, high).	0	111 (64 Mod, 47 High)	58 miles (36 Mod, 22 High)	106 miles (60 Mod, 46 High)
Miles of active UAR restoration by water quality risk rating (low, mod or high).	0	66 total (14 Low, 37 Mod, 15 High)	133 total (96 Low, 23 Mod, 14 High)	93 total (58 Low, 19 Mod, 16 High)
Miles of NFTS road to be downgraded or stored as level 1, in a maintenance free condition, measured by water quality risk rating (low, moderate, high).	0	31 total (17 Low, 6 Mod, 8 High)	69 total (31 Low, 27 Mod, 11 High)	36 total (11 Low, 12 Mod, 13 High)
Reducing the Risks of Adverse Impacts to Water Quality – Total Indicator Score	***(1)***	***(2)***	***(4)***	***(3)***

[58] A score of (4) indicates the alternative has the least adverse impact for water quality related to the indicator. A score of (1) indicates the alternative has most impact for water quality related to the indicator. Miles are approximate.

Compliance with the Forest Plan and Other Direction

Alternative 1 (No Action) would not be in compliance with the Forest Plan or the Clean Water Act because many of these routes are currently eroding, resulting in sedimentation of some streams and there would be no mechanism to restore or mitigate these impacts. All proposed changes to the NFTS must comply with the Clean Water Act regulations and the Forest Plan direction for water quality protection. In order to be in compliance with the regulations imposed by the above mentioned documents, all of the roads or motorized trails that were rated as a high or moderate risk to water quality, have project design features included to reduce the potential for adverse impacts to water quality to low levels. The design features include installing larger stream crossing culverts, installing waterbars or constructing rolling dips to reduce diversion potential. Active restoration is prescribed for all roads removed (decommissioned) from the NFTS. Most UARs not designated to the NFTS would have active restoration were needed to insure the roads and trails are left in a free draining, hydrologically benign condition, with physical barriers installed to restrict motor vehicle use. Some UARs would not have physical road closures. These would not be shown on the MVUM and not utilized by the public. In this case, passive restoration would occur when motorized vehicle use no longer occurs, leading to revegetation of the travelway, setting the stage to restore natural drainage patterns in the long term.

None of the watersheds are listed as water quality impaired under §303(d) of the Clean Water Act. All of the action alternatives meet the conditions of the North Coast Water Quality Control Board, Waiver of Waste Discharge Requirement, Order No. R1-2010-0029 (The Waiver).

Implementation and annual evaluation of BMPs, along with implementation checklists at the project level serve to insure compliance with The Waiver. A complete listing of best management practices that apply to this project can be found in Appendix D.

Wildlife

Introduction

Management activities on NFS lands are planned and implemented so that they do not jeopardize the continued existence of threatened or endangered species, or lead to a trend toward listing or loss of viability of Forest Service Sensitive species. In addition, management activities are designed to maintain or improve habitat for management indicator species (MIS) to the degree consistent with multiple-use objectives established in each Forest Plan. Management decisions related to motor vehicle travel can affect terrestrial species by increasing human-caused mortality, changing behavior due to disturbance, and modifying habitat (Gaines et al. 2003, Trombulak and Frissell 2000, Summers et al. 2011). It is Forest Service policy to minimize harassment to wildlife and minimize significant disruption of wildlife habitat while providing for motor vehicle use on NFS lands.

Analysis Framework: Statute, Regulation, Forest Plan, and Other Direction

Direction relevant to the proposed action as it affects terrestrial wildlife includes:

The Endangered Species Act of 1973

This act states that each federal agency shall, in consultation with and with the assistance of the Secretary insure that any action authorized, funded, or carried out by such agency is not likely to jeopardize the continued existence of any threatened or endangered species or result in the destruction or adverse modification of habitat of such species. Section 7 of the ESA, as amended, requires the responsible federal agency to consult the USFWS concerning threatened or endangered wildlife species under their jurisdiction.

Northern Spotted Owl Revised Recovery Plan

On June 28, 2011, the USFWS released the Revised Recovery Plan for the NSO (Northern spotted owl, *Strix occidentalis caurina*). The purpose of recovery plans is to describe reasonable actions and criteria that are considered necessary to recover a listed species. The *2011 Revised Recovery Plan for the Northern Spotted Owl* (Recovery Plan) represents the *best available science*. The 2011 Recovery Plan recognizes the importance of maintaining, and restoring, habitat for the recovery and long-term survival of the NSO. The 2011 Recovery Plan relies on federal lands to provide the major contribution for recovery (USDI Fish and Wildlife Service 2011).

Northern Spotted Owl Revised Critical Habitat

On December 4, 2012, the Final 2012 Northern Spotted Owl Critical Habitat rule was published (77 Fed Reg. 71876-72068). *Critical habitat* consists of those areas, which have "physical or biological features (I) essential to the conservation of the species and (II) which may require special management considerations or protection (16 USC §1532(5)(A))." Federal agencies are required to consult on any project that may affect newly designated Critical Habitat under the ESA.

Neotropical Migrant (NTM) Birds

The January 2000 USDA Forest Service *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 (MOU) between the USDA Forest Service and the USFWS 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 USFWS as well as other federal, state, tribal and local governments. Within the national forests, conservation of migratory birds focuses on providing a diversity of habitat conditions at multiple spatial scales and ensuring that bird conservation is addressed when planning for land management activities.

The National Forest Management Act (NFMA)

The NFMA provides direction on selection of MIS, which represent larger groups of species filling similar ecological niches or occupying similar habitats. These species and their habitats have been aggregated and described in the Forest Plan. During the NEPA process, the project-level MIS effects to these aggregations are analyzed and disclosed. The intent is that the forest will manage for the needs of representative species or for an assemblage of species using the same habitat.

Forest Service Manual 2670

Forest Service Manual 2670 provides direction regarding Forest Service Sensitive species, which have been identified by the regional forester as species for which population viability is a concern. The Forest Service develops and implements management practices to ensure that rare plants and animals do not become threatened or endangered and ensure their continued viability on national forests.

Forest Service Manual 2353.03(2)

Forest Service Manual 2353.03(2) provides direction to minimize damage to vegetation, minimize harassment to wildlife, and minimize significant disruption of wildlife habitat while providing for motor vehicle use on NFS lands.

1995 Six Rivers National Forest Land and Resource Management Plan (Forest Plan)

The Forest Plan identifies the following standards and guidelines applicable to motor vehicle travel management and terrestrial wildlife (Table 3-149), which are applied to all alternatives and will be considered during the analysis process:

Table 3-149. Forest plan standards and guidelines for wildlife and travel management.

Reference	Standard and Guideline
General Wildlife Management	
IV-97, 8-2	Activities generating loud or continuous noise (e.g., timber harvest, road construction, hauling, blasting, frequent vehicle traffic, powerboats, large crowds of people, etc.) will be restricted during the periods shown in Table IV-11 in the Forest Plan within the distances or areas listed for each species. (Restrictions may be waived after the dates listed in parentheses if the area is not occupied or has failed - use standardized protocol).
Endangered, Threatened, Proposed Candidate, and Sensitive Species	
IV-99, 8-4	Biological assessments/evaluations for endangered, threatened, proposed, candidate and Sensitive species will be prepared for every project to determine if the project *may affect* these animals. This evaluation will determine the effects of the proposed activity on these species and their habitat (designated habitat area), including beneficial effect or likely to adversely affect. A field reconnaissance to determine if a species is present or expected should be completed as part of the biological evaluation process if the species or suitable habitat is likely to occur in the project area.
Bald Eagle and Peregrine Falcon	
IV-99, 8-9	Eliminate or minimize disturbance to breeding birds from vehicle traffic in the locations and periods listed in Table IV-11 in the Forest Plan. Vehicle use includes motorized vehicles such as automobiles, snowmobiles, and OHVs as well as riverway vehicles such as jet skis, rafts, and boats.
IV-99, 8-10	Disturbance-generating activities (e.g., road construction and reconstruction, hauling, dredging, blasting) should be restricted during the breeding season in proximity to nesting pairs during the period listed in Table IV-11 in the Forest Plan.
Northern spotted owl	
IV-100, 8-14	Spotted owl habitat will be managed according to the direction in the FSEIS ROD until a recovery plan is completed and adopted by the US Forest Service. Management direction regarding the northern spotted owl is contained in the special habitat management area section of this chapter. Reasonable and prudent measures identified by the USFWS during consultation will be incorporated in project plans. Habitat fragmentation in surrounding habitat should be minimized or reduced.

Marbled murrelet	
IV-100, 8-17	Marbled murrelet habitat will be managed according to the direction in the FSEIS ROD until a recovery plan is completed and adopted by the US Forest Service. Management direction regarding the marbled murrelet is contained in the special habitat management area section in this chapter. Reasonable and prudent measures identified by the USFWS during consultation will be incorporated in project plans. Habitat fragmentation in surrounding habitat should be minimized or reduced.
IV-100, 8-18	Observe restrictions on loud and continuous activities within 0.25 mile of nest sites and activity centers during the period listed in Table IV-11 in the Forest Plan.
Candidate Species	
IV-100, 8-19	Known nest sites, roost sites, den sites and associated micro-habitat conditions will be protected for candidate species.
California wolverine	
IV-100, 8-20	Maintain habitat characteristics consistent with their Habitat Capability Model (FEIS Appendix B) at den sites.
Fisher and American marten	
IV-102, 8-31 IV-102, 8-32	Maintain habitat characteristics consistent with their Habitat Capability Model (FEIS Appendix B) at den sites within 500 feet of known den sites.
Pacific (Townsends) big-eared bat	
IV-100, 8-22	Maintain essential habitat characteristics near roost sites (e.g., caves, mine tunnels, buildings). In areas with a high potential for disturbance, secure entrances to roost/maternity areas with a gate system, which allow bats in and out but exclude humans. Reduce disturbance at occupied sites during critical time periods (see Table IV-11 in the Forest Plan).
IV-100, 8-23	The management direction for all bats listed at the end of this section (other species from the FSEIS ROD) also applies for the Pacific big-eared bat.
Del Norte salamander	
Management direction regarding the Del Norte salamander is contained in the Managed Habitat Management Area section of the Forest Plan.	
Western pond turtle	
IV-100, 8-24	Maintain habitat characteristics consistent with their Habitat Capability Model (FEIS, Appendix B Table 12) within 300 feet around occupied pond and stream habitats.
Northern goshawk: The following standards and guidelines are intended to provide management direction for northern goshawks within the Klamath and California Coastal Provinces. Although intended for application in Matrix lands and Adaptive Management Areas, the habitat goals described should also be considered in assessments of Late Successional Reserves.	
IV-101, 8-28	III. Disturbance: Restrict activities producing loud and/or continuous noise within 0.25 miles of active nest sites as shown in Table IV-11 in the Forest Plan. Normal levels of vehicle traffic on existing roads may be allowed in cases where goshawks appear to be habituated to such activities (see Table IV-11 in the Forest Plan).
IV-101, 8-28	IV. Implementation: These guidelines may be superseded by the adoption of a conservation strategy for Northern Goshawk, and modified in response to new information.
Black bear	
IV-102, 8-38	Maintain vegetation near the den or wallow that provides a visual screen from roads, trails, and other areas frequented by people
Harvest Species	
IV-102, 8-33	Vegetative security/ screening cover along heavily used roads adjacent to high value areas for wildlife (meadows, glades, ponds, springs, seeps, key deer or elk areas) will be retained.
Species of Concern: State of California listed species have been addressed in previous sections as federally listed threatened and endangered species or Forest Service Sensitive species.	
IV-103, 8-40	A management zone that maintains essential habitat characteristics and minimizes adverse disturbances will be designated around known nest sites of species of concern. Feeding areas and wintering areas may also require some level of protection.
Osprey	
IV-103, 8-42	Maintain essential habitat characteristics within 500 feet of nest trees, and minimize potential disturbances from developments (recreation/ roads).

<table>
<tr><th colspan="2">Additional Species from the Forest Plan FSEIS ROD</th></tr>
<tr><td colspan="2">Bats: Management standards and guidelines that may be included as mitigation measures in project or activity plans will be developed for the site. These standards will be developed following an inventory and mapping of resources. The purpose of the standards and guidelines will be protection of the site from destruction, vandalism, disturbance from road construction or blasting, or any other activity that could change cave or mine temperatures or drainage patterns. The size of the buffer, and types of activities allowed within the buffer, may be modified through the standards developed for the specific site.
When Townsends big-eared bats are found occupying caves or mines on federal land, the appropriate agency should be notified, and management prescriptions for that site should include special consideration for potential impacts on this species.</td></tr>
<tr><th colspan="2">Survey and Mange Species</th></tr>
<tr><td>IV-84, 7-1</td><td>Management of known species sites should receive the highest priority. Activities implemented in 1995 and later must include provisions for these known sites.</td></tr>
<tr><td>IV-84, 7-2</td><td>Survey prior to ground-disturbing activities. Management standards will be developed to manage habitat for the species on sites where they are located</td></tr>
</table>

The S&M standards and guidelines were developed under the NWFP (amended in 2001) to benefit species closely associated with late-successional and old-growth forests. Species include plant (vascular and non-vascular), fungi, terrestrial mollusk, aquatic mollusk, and vertebrate species. The S&M provision for each species would apply to the range (or portion of the range) of that species, to the particular habitats where concerns exists for species' persistence, and where management activities are considered *habitat disturbing* for that species (USDA/USDI 2001).

Survey and Manage species are associated with late-successional forests, which provide habitat components, microclimatic conditions and other life supporting attributes for the persistence of these species at a given site; therefore, only those activities associated with habitat removal coincident with mid-mature stands could potentially affect S&M species. This is supported by the Pechman exemptions, which are provisions ordered by the court in *Northwest Ecosystem Alliance et al. v. Mark E. Rey et al.*, No. 04-844P, (W.D. Wash. October 10, 2006). Pre-project surveys are not required in the following situations:

- Thinning projects in stands younger than 80 years old;
- Replacing culverts on roads that are in use and part of the road system, and removing culverts if the road is temporary or to be decommissioned;
- Riparian and stream improvement projects where the riparian work is riparian planting, obtaining material for placing in-stream, and road or trail decommissioning; and where the stream improvement work is the placement of large wood, channel and floodplain reconstruction, or removal of channel diversions; and
- The portions of projects involving hazardous fuel treatments where prescribed fire is applied. Any portion of a hazardous fuel treatment project involving commercial logging will remain subject to the survey and manage requirements.

The Smith River NRA River Basin Assessment (Watershed Assessment) and Late Successional Reserve Assessment identifies the management strategy for LSRs on the Smith River NRA, including criteria for developing appropriate treatments.

Effects Analysis Methodology

The project includes the entire NFTS road system and UARs on Smith River NRA and Gasquet District, which encompasses 358,842 acres.

In 2005, the Smith River NRA completed the Smith River NRA RAP/OHV Strategy. Forest Service personnel evaluated the road system during the NRA RAP/OHV Strategy process to determine access needs and resource risks, with additional field verification during the development of the proposed action for this project. Since the RAP was completed, additional field review has been accomplished, which has refined mileage for both system and non-system roads (UARs) and, in some cases, corrected risk ratings.

The RAP identified key questions and issues affecting road-related management on the forest. Each team member used resource-specific evaluation criteria (NRA RAP/OHV Strategy, Appendix A) that had been developed to determine risk and/or need of each ML 1, 2 road and UAR. The issue concerning wildlife involved "the risk to Threatened, Endangered and Sensitive wildlife and their habitats, habitat fragmentation, and direct impacts to wildlife".

The rating criteria for each resource are scientifically based and were developed by specialists across the forest during the 2003 Six Rivers National Forest Forest-wide Roads Analysis Process. The risk to resources were determined based on information using the best available science from survey results, computer models, forest GIS layers, resource-specific assessments (i.e. LSR assessments), and research publications.

Every ML 1 and 2 road and inventoried UAR on the Smith River NRA was evaluated for the risk to wildlife using the evaluation criteria (NRA RAP/OHV Strategy, Tables 1 and 2). Risk ratings were assigned to each road in its entirety, even though the rating may be based on a single Sensitive site. The RAP then recommended road- and route-specific management options to reduce risks to resources and to better meet the transportation needs of the public and the Forest Service.

Where possible, actions were proposed that could mitigate resource risks on high need roads/routes. If it was not possible or practical to mitigate the resource risk, the road/route was proposed for decommissioning or restoration.

Assumptions Specific to the Wildlife Analysis

- No surveys were conducted specifically for this project, as district-wide surveys for multiple species would be infeasible. Existing surveys and data were used to determine breeding locations and occupancy of habitat. Where data are lacking, high-quality (high-probability of occupancy) suitable habitat is assumed to be occupied.
- All routes provide the same level of disturbance, unless local data or knowledge indicates otherwise.
- All vehicle types result in the same amount of disturbance effect to wildlife.
- In the long-term, habitat on decommissioned roads and restored UARs will improve due to vegetation restoration and decreased fragmentation.
- Maintenance Level 1 roads are closed to vehicle use year-round and revegetate naturally, and therefore do not contribute to open road densities. Miles of road downgraded to ML 1 are analyzed with those being decommissioned or restored.

- Annual road maintenance activities are expected to occur on a subset of the district's roads/routes (depending on site-specific conditions) to ensure public and administrative safety and to reduce resource damage.

Data Sources

- Forest-level GIS habitat layers comparing proposed routes with species-specific suitable habitat, designated areas (i.e. critical habitat, LSRs) and known wildlife sites.
- Site-specific personal knowledge of agency biologists was used where forest-level data were not current or not available.
- The latest federal species list for the project area was obtained from the USFWS. Currently the USFWS is developing the IPAC website for agencies to obtain federal species lists, but the results of species lists are not yet reliable. The Interagency Level 1 team (biologists from the USFWS and Forest Service) reviewed the May 25, 2016 species list obtained from IPAC, and determined the species list found in the forest-wide Reference Document (2016) was specific to the SRNF and still valid for this project area. The Region 5 Forest Service Sensitive wildlife species list was identified from the US Forest Service – Pacific Southwest Region Sensitive Animal Species List, September 9, 2013.
- California Wildlife Habitat Relationships program (CWHR version 8.0; California Department of Fish and Wildlife 2008).

Indicators

- Miles of UARs or miles of routes proposed for addition to the NFTS in potential habitat and designated areas (LSRs, critical habitat).
- Number of Sensitive sites (location or site center for the most recent pair or territorial single) for threatened and Forest Service Sensitive species within 0.25 mile of an added route or area.
- Miles/percent of system roads and UARs decommissioned/restored.
- Road density by 5th-field watershed greater than 3 miles per square mile. Open road density includes NFTS roads and all UARs open to vehicle traffic. For Alternative 1, all UARs are considered open roads.

Affected Environment

There are an estimated 131 bird species, 68 mammal species, and 35 herptile species known or thought to occur on the Smith River NRA/Gasquet Ranger District. Of these, 15 are listed as threatened or Forest Service Sensitive species (Table 3-150).

Threatened, Proposed, and Forest Service Sensitive Species

Currently there are no endangered wildlife species or any species *proposed* for federal listing on the forest. The list of *threatened* species for the SRNF was provided by the USFWS. Forest Service Sensitive species are identified on the Pacific Southwest Region Regional Forester's Sensitive Species List (2013). The Forest Service Sensitive species list contains species that are of special concern. This list is updated periodically, as species needs change. The recent list contains species that were not addressed in the Forest Plan, and removed certain species that were addressed. The 2013 Region Regional Forester's Sensitive Species List serves as an update to the Forest Plan regarding species considered.

The following federally listed or Forest Service Sensitive species are known to or may occur in the project area, according to historic records, current sightings and, in some cases, formal surveys. This is based upon the best available information at this time and the level of likelihood of species occupying territories/habitat where they could be affected by the project. See the *Six Rivers National Forest Species Reference Document* (USDA Forest Service, SRNF 2016) for species life history information, including information on listed or Forest Service Sensitive species that will not be affected by this project.

Table 3-150. Threatened (T), proposed (P), and Forest Service Sensitive species (FSS) occurring on the Smith River NRA.

Species	Status	Critical Habitat Designated
Northern spotted owl (*Strix occidentalis caurina*)	T	Yes
Marbled murrelet (*Brachyramphus marmoratus*)	T	Yes
Fisher (*Pekania pennanti*)	FSS	-
Bald eagle (*Haliaeetus leucocephalus*)	FSS	-
Northern goshawk (*Accipiter gentilis*)	FSS	-
Humboldt marten (*Martes caurina humboldtensis*)	FSS	-
California wolverine (*Gulo gulo luteus*)	FSS	
Townsends big-eared bat (*Corynorhinus townsendii*)	FSS	-
Southern torrent salamander (*Rhyacotriton variegatus*)	FSS	-
Foothill yellow-legged frog (*Rana boylii*)	FSS	-
Northern red-legged frog (*Rana aurora aurora*)	FSS	-
Western pond turtle (*Clemmys marmorata*)	FSS	-
Fringed Myotis (*Myotis thysanodes*)	FSS	-
Western bumblebee	FSS	-
Mardon Skipper (*Polites mardon*)	FSS	-

Management Indicator Species

The Six Rivers' Forest Plan selected 41 species as MIS or assemblages (groups of species with similar habitat requirements) for a variety of habitats affected by resource management activities on the forest (Table 3-151). Management indicator species were selected based on their roles in their respective biotic assemblage or community. Many MIS occupy a niche in their particular assemblage that may be extremely sensitive to management related disturbance. Other MIS were selected based on concern for their current population status. Management indicator species are thought to be indicative of the integrity of communities as a whole, and provide an assessment of the overall health of the represented habitats/ecosystems.

Table 3-151. Management Indicator Species and habitat assemblages.

Group	Species
Individual Species	Northern spotted owl
	Pileated woodpecker
	Black bear
	American marten
	Fisher
	Black-tailed deer
Bog/Seep/Spring/Wet Meadow Assemblage	Southern torrent salamander
Marsh/ Lake/ Pond/ Assemblage	Northern red-legged frog
	Western pond turtle
	Wood duck
River/Stream/Creek Assemblage	Cutthroat trout
	Rainbow trout
	Steelhead / Summer Steelhead
	Tailed frog
	Common merganser
	Ruffed grouse
	Winter wren
	American dipper
	Yellow-breasted chat
Tanoak/Madrone Assemblage	Hammonds flycatcher
	Western tanager
	Black-headed grosbeak
Snag Assemblage	Flammulated owl
	Western screech owl
	Red-breasted sapsucker
	Downy woodpecker
	Hairy woodpecker
	White-headed woodpecker
	Vauxs swift
	Brown creeper
	Western bluebird
	Douglas squirrel
Down Woody Debris Assemblage	Arboreal salamander
	Clouded salamander
	Blue grouse
	Dusky-footed wood rat
	Western fence lizard
Black Oak/White Oak Assemblage	Acorn woodpecker
	Scrub jay
	Lazuli bunting
	Western gray squirrel

Neotropical Migrant Birds

There are 67 NTM species known or thought to occur on the Smith River NRA (Table 3-152). Under the NFMA, the Forest Service is directed to "provide for diversity of plant and animal communities based on the suitability and capability of the specific land area in order to meet overall multiple-use objectives." (PL 94-588, §6(g)(3)(B)).

The Forest Plan meets the objectives of maintaining wildlife populations by providing the variety, distribution and amount of wildlife habitat types necessary to achieve this goal. Implementation of the project is in accordance with the objectives within Executive Order 13186, which outlines responsibilities of federal land management agencies to the Migratory Bird Treaty Act.

Table 3-152. Neotropical migratory bird species and habitat associations of Del Norte County and those known or thought to occur within the project area.

Common Name	Habitat Association	Common Name	Habitat Association
Common Merganser	W	Hermit Thrush	F
Turkey Vulture	O	Swainsons Thrush	F
Osprey	W	American Robin	F, O, R
Peregrine Falcon	W,O,F	Cedar Waxwing	F, O
Northern Goshawk	F	Loggerhead shrike	O
Coopers Hawk	F, R, O	Cassins Vireo	F
Sharp-shinned Hawk	F, R	Warbling Vireo	R, F
Red-tailed Hawk	O, F, R	Nashville Warbler	F, O
Band-tailed Pigeon	F, O	Black-throated Gray Warbler	F, O
Flammulated Owl	F	Hermit Warbler	F
Common Nighthawk	O, F	MacGillivrays Warbler	F, R, O
Annas Hummingbird	R, F, O	Yellow Warbler	F,R
Allens Hummingbird	F, O	Orange-crowned Warbler	F
Rufous Hummingbird	F, O	Yellow-rumped Warbler	F, O
Belted Kingfisher	W	Townsends Warbler	F
Yellow-bellied Sapsucker	F, O	Wilsons Warbler	F, R
Northern Flicker	F, R, O	Common yellowthroat	W
Red-breasted Sapsucker	F	Yellow-breasted chat	R
Hammonds Flycatcher	F	Western Tanager	F
Olive-sided Flycatcher	F, O	Lazuli Bunting	O
Dusky Flycatcher	O, F	Black-headed Grosbeak	F, R
Pacific-slope Flycatcher	R, F	Spotted Towhee	O
Western Wood-Pewee	F, R	Green-tailed Towhee	O
Willow Flycatcher	R, O	Chipping Sparrow	F, O
Barn Swallow	O, R, F	Fox Sparrow	O,R
Tree Swallow	R, O, W	White-crowned Sparrow	O, F
N. Rough-winged Swallow	W	Song Sparrow	O, F, R
Violet-green Swallow	R, F, O	Dark-eyed Junco	O, F
Cliff Swallow	O, R	Brewers Blackbird	O
Oak Titmouse	O, F	Brown-headed Cowbird	O, R, F
House Wren	O, F, R	Purple Finch	F,R
Ruby-crowned Kinglet	R, F	Cassins Finch	F
Golden-crowned Kinglet	F	Pine Siskin	F, R
Townsends Solitaire	F		

Survey and Manage Species

Survey and Manage species are associated with late-successional forests, which provide habitat components, microclimatic conditions and other life supporting attributes for the persistence of these species at a given site; therefore, only those activities associated with habitat removal coincident with mid-mature and older stands could potentially affect S&M species. The only wildlife S&M species that occurs on the Smith River NRA is the red tree vole (*Arborimus longicaudus*).

Existing Condition

There is little information available on wildlife species diversity, abundance and distribution in the Smith River Watershed. In view of this, models describing habitat requirements were used to assess potential suitable habitat within the watershed. These models were developed by the forest for the Forest Plan. The models describe the quality and distribution of the habitat needed to maintain viable populations of species or species assemblages. The species and assemblages vary in the type of habitat with which they are associated and were chosen to represent the diversity of habitats occurring on the forest.

Vegetation data used to run the models included data from ecology plots, stand exams, and ecological unit inventories (vegetation series and seral stages). However, a proper assessment of suitable habitat depends not only on a detailed description of the vegetation, but also on data on special habitats (especially for riparian areas). The incompatibility between the available data and the variables required to run the models made it necessary to resort to estimates of potential suitable habitat based only on variables such as vegetation series and seral stage.

The results from the model runs are only an estimate of the amount of potential suitable habitat present in the watershed and were used with caution. Determining the actual amount of preferred habitat for each species or species assemblage would require more detailed habitat data than the models and current databases provide. Updating and refining the habitat suitability models, (including field research to determine species habitat requirements), and tailoring vegetation data collection would be required. No estimates of population size, distribution, or density were made based on estimates of potential suitable habitat from these model runs.

Coniferous forest is the dominant vegetation type within the Smith River Basin, with the majority of the remaining late-successional habitat in State and federal ownership. Eighty-seven percent (287,393 acres) of the Smith River NRA is covered by coniferous forests. There are 160,148 (55 percent) acres of mature old-growth forests on the Smith River NRA, 90,754 (31 percent) acres of which are considered suitable (specific vegetation types) for the NSO and other late-successional forest species. This information includes habitat impacts from the 2015 wildfires.

Extensive logging on the private land to the west of the Smith River NRA has converted most of the late-successional forests to early seral stages, agricultural lands, or housing. Within the Smith River NRA, over 58,000 acres have been harvested by former private landowners and the Forest Service. Most of this harvest was concentrated in the late-seral Douglas-fir and Douglas-fir/tanoak series. Approximately 50 percent of this series and seral stage has been harvested within the Smith River NRA.

Habitat pattern and configuration has been altered in the Smith Basin because of natural and human disturbance. Wildfire, flood, wind throw, insect infestations, disease, timber harvest, mining, and development have all had an impact on the quality and quantity of habitat for many species within the basin, especially those associated with late-successional habitat. The amount and patch size of late-successional habitat affects the diversity, abundance, and distribution of late-seral dependent species. In addition, patch shape is very important, as the amount of interior habitat appears to have the highest chance of influencing species survival (Picton 1979). Long, narrow patches may have no effective interior habitat. Fragmentation and insufficient patch size and shape can lead to a reduction in available food and cover, and increased mortality by predation and competition by invasive edge species.

The distribution and connectivity of patches across the landscape affect the daily and seasonal movement of animals. Connectivity of habitat provides for movement of adults searching for mates and for juveniles dispersing from natal territories. Juveniles disperse in a random direction, so maintenance of stands to facilitate dispersal in all directions increases the likelihood of survival. Movement of adults increases the genetic fitness of the overall population and allows for recolonization of abandoned areas. Therefore, connectivity between patches is of concern.

Late-successional dependent species may have different patch size requirements; however, in general larger patch sizes with low perimeter to interior ratio are preferred due to the greater amount of interior habitat. Combining the mid-mature, late-mature, and old-growth seral stages, the greatest frequency of patch-size (91 percent) is in patches of 200 acres or less, with the lowest patch-size frequency (4 percent) occurring in patches of 500 acres or greater. However, the Forest Plan considers the North Zone of the SRNF, which includes the Smith River NRA and a portion of the Orleans Ranger District, to have the lowest degree of fragmentation, relatively speaking, on the forest. In addition, 57 percent of the North Zone has patch shapes with high interior acres.

Late-Successional Reserves

The Smith River NRA has 76,463 acres protected in five LSRs. This includes two large LSRs, two extensions from a larger LSR in Oregon, and one small 255-acre reserve. In addition, two 100-acre LSRs have been mapped around known NSO pairs.

Northern spotted owls, and other late-successional dependent species, are strongly associated with dense, mature and old-growth forests. These habitats provide the structural characteristics required by these species for food, cover, nest sites, and protection for weather and predation. Desired late-successional forest characteristics (NWFP ROD B-5) are: 1) multi-species and multi-layer assemblages of trees, 2) moderate to high accumulations of large logs and snags, 3) moderate to high canopy closure 4) moderate to high numbers of damaged, deformed trees, 5) moderate to high accumulations of fungi, lichens, and bryophytes. There are 39,593 acres of late-successional habitat in the Smith River LSRs. The amount of acres meeting these criteria per LSR is listed in Table 3-153.

Table 3-153. Amount of suitable habitat by Late-Successional Reserve in acres.

Seral Stage	Haines #RC 303	Siskiyou #RC 302	Rowdy Creek #RC 250	Monkey Creek #RC 250	Rock Creek #RC 301
Mid Mature	8,973	5,320	1,579	210	179
Late Mature	1,160	411	145	150	5
Old Growth	9,635	9,592	1,206	757	50
Total	***19,768***	***15,323***	***2,930***	***1,117***	***234***

Roads

Roads have impacts on wildlife and wildlife habitat that are disproportionate to the area of land they occupy (Beebee 2013). The forest road system and human use of those roads has altered terrestrial species habitat and populations. Negative effects can include habitat loss and fragmentation; avoidance or road kill; poaching, and over harvest. Roads can also undermine ecological processes through fragmentation of wildlife populations, restrictions of wildlife movements, and the disruption of gene flow and metapopulation dynamics (Jackson 2000).

Roads and past timber harvest are major causes of forest habitat fragmentation on the forest. Habitat quality can be reduced by breaking up blocks of continuous habitat and increasing the amount of edge habitat, which is detrimental to species that require interior habitat conditions (Marcot et al. 1994, Hann et al. 1997). Edge effects create unsuitable habitat along the boundary due to changes in microclimate (increased sunlight and temperatures, drying, etc.), which causes forest-dependent species shift activity away from edges, reducing abundance along edges (Semlitsch et al. 2007).

Natural populations of animal species are affected by the presence of roads by avoidance by some species and attractiveness to them by others. Roads and their adjacent environment qualify as a distinct habitat and can result in a change at the species, population, and landscape scales. Some species are associated with edges, including those that use roads as corridors to find food. Roads facilitate invasion by exotic species or of native species attracted to new habitat areas (i.e. nest parasites) that can disrupt the structure and function of the ecosystem (Jackson 2000; Gucinski et al. 2001).

Roads can also act as a barrier to terrestrial species movement. When populations of less mobile species (such as amphibians) become subdivided, there is increased risk of local extinction of subpopulations, reduced potential for recolonization after a local extinction, and a progressive loss of local biodiversity (Gucinski et al. 2001).

Road access can also facilitate harassment, in terms of noise disturbance during the breeding season. Harassment can lead to reductions in productivity or displacements in population distribution or habitat use. Many species also are vulnerable to increased mortality from highway accidents with motorized vehicles (Trombulak and Frissell 2000).

Most native terrestrial species located on the forest are adversely affected by road-associated factors that can degrade habitats or increase mortality. In landscapes with moderate to high road density, habitats are likely underused by many species that are negatively affected by road-associated factors. Road use may cause a reduction of daily movements, which limits habitat use and home range size (Cole et al. 1997, Rowland et al. 2005).

The presence of roads on the landscape represents a direct loss of habitat. For example, one mile of road, with the associated clearing width (anywhere from 18 to 50 feet), can remove from 2 to 6 acres per mile respectively. In some cases, this could represent a permanent loss if the road surface prevents vegetation from becoming re-established. In addition, as long as the road is in use and is not revegetated the habitat is lost to use by wildlife species.

In addition to habitat effects, use of district roads can generate noise that can disturb wildlife in adjacent areas. Ongoing public use and continued routine road maintenance is expected, although the project is not expected to substantially add to the existing or foreseeable use of roads in the area. The habitat along these roads is expected to continue to be of low to moderate value for many wildlife species due to high ambient noise level and human presence, and potential habitat degradation through the removal of dead and dying trees that pose a safety hazard.

The project area encompasses the Smith River NRA and is comprised of the North, Middle, and South forks of the Smith River. The North Fork is considered a barrier to dispersal of late-successional habitat species because of the low amounts of cover and small diameter trees naturally occurring on the serpentine soils characteristic of the area. Dispersal to the north is primarily outside of the serpentine area to the northwest along Rowdy Creek and to the northeast along Patricks Creek and the upper reaches of the Middle Fork into the Illinois Valley. Private land on the coast may present a barrier because of the high levels of timber harvest and development. Patches of second growth on these lands make dispersal through this area possible. The Middle Fork of the Smith along with US Highway 199 and occasional development create a wide, non-forested strip that may preclude many species from crossing. Movement along the Middle Fork to the east or west is more likely for some species. Dispersal to the south and southeast in the South Fork Smith is facilitated by the Siskiyou Wilderness, which provides large, un-fragmented patches of mature and old-growth habitats along the western edge of the Siskiyou Mountains.

The North Fork drainage has experienced little change in natural processes because of land management activities. It has the current road density of 0.42 miles per square mile. The Middle Fork drainage has the highest current road density (1.62 miles per square mile), due to over 100 miles of state and county roads. The South Fork drainage is the largest of all three forks, with a current road density of 1.12 miles per square mile.

Threatened Species

Northern Spotted Owl (NSO)

Northern spotted owls are strongly associated with dense mature and old-growth Douglas-fir forests. These habitats provide the structural characteristics required by the owls for food, cover, nest sites, and protection from weather and predation. Suitable spotted owl habitat, as defined by the Forest Service, is composed of mature timbered stands having multi-layered conditions, a canopy closure of 60 percent or greater and obvious decadence (large, live coniferous trees with deformities—such as cavities, broken tops, and dwarf-mistletoe infections). The overstory should be comprised of 21-inch dbh (diameter at breast height) or greater trees and should comprise at least 40 percent of the total canopy closure (Forest Plan).

Habitats used for foraging in this portion of the owls range can be highly variable. Owls will often foraging in younger stands with high prey densities and access to prey (Carey et al. 1992; Rosenberg and Anthony 1992; Thome et al. 1999; Irwin et al. 2012). Foraging also often occurs in stands of nesting and roosting habitat with mature and old-forest characteristics. High quality foraging habitat characteristics can include multi-layered conifer stands with high canopy closure, forest patches within riparian zones of low-order streams and edges between conifer and hardwood forest stands; brushy openings and dense young stands or low-density forest patches within a mosaic of mature and older forest habitat; concentrations of downed woody debris and sufficient open space below the canopy for northern spotted owls to fly.

There are an estimated 90,754 acres of suitable spotted owl nesting/roosting habitat and 87,292 acres of potential foraging on the Smith River NRA. This comprises approximately 50 percent of the total land base of the Smith River NRA. Approximately 40,000 acres of what is considered nesting/roosting habitat for the NSO is in the mid-mature seral stage. Although this seral stage meets the size class and canopy cover requirements, it often lacks multi-layered conditions, large snags, downed logs, and trees with deformities necessary to meet the habitat needs of this species. Therefore, the suitable habitat available to NSO and other late-successional species may be less than what is estimated here.

In 2010 and 2011, all the known forest NSO activity centers (ACs) were surveyed to determine the current status of the AC. Using the information gained, a review was conducted in 2012, with concurrence of USFWS, assessing the validity of the 374 established ACs on the forest. Valid ACs were determined based on the criteria presented in the *Protocol for Surveying Proposed Management Activities that May Impact Northern Spotted Owls* (USFWS 2011). During this review, 208 ACs were considered valid and kept in their original location. A further 99 were moved from their original locations. Activity center locations were moved when the original location had been mapped incorrectly; when there were new detections that were higher in the hierarchy within AC locations (i.e. new pair location replaced a territorial single location); or in the case of habitat disturbance or loss at the site center, AC locations were moved to the nearest high quality habitat. Finally, 67 ACs were dropped or retired because they either did not meet the minimum criteria and should not have been delineated as an AC in the first place, or extensive habitat loss occurred throughout the AC (e.g., fire). A total of 307 ACs of varying reproductive and occupancy status are now recognized by the forest.

There are 44 known NSO ACs in the Smith River NRA. Of these, 34 have been confirmed as pairs and 10 as territorial singles (recorded from both historical records and survey data). There are 59,527 acres of NSO Critical Habitat designated in the watershed, 41,027 acres of which overlap with the LSR.

Marbled Murrelet (MAMU)

Murrelets nest from southeast Alaska to central California in old-growth and mixed stands of mature and old-growth coniferous forests within 50 miles of ocean waters (Carter and Sealy 1986). Marbled murrelet have been found to nest in mature and old-growth stands containing Douglas-fir, coast redwood, western red cedar, mountain hemlock, Sitka spruce, and western hemlock (Quinlan and Hughes 1990; Singer et al. 1991, 1995; Hamer and Nelson 1995; Nelson et al.2006). Generally, the habitat characteristics associated with MAMU nesting are large trees with large branches or deformities, which provide nesting platforms.

This usually does not develop until trees are 150 to 175 years of age. The nesting platforms typically require some degree of protective canopy surrounding them. This protective canopy may come from the nest tree itself or from surrounding trees. The number of platforms, moss depth and vertical and horizontal cover of the nest appear to be key factors in MAMU nest site selection (Nelson et al. 2006). The farthest inland nest in California was located 18 miles (29 km) from the ocean (Hamer and Nelson 1995). The majority of MAMU observations to date have been below 2,000 feet elevation, with some detections between 2,000 and 3,000 feet.

On the Smith River NRA, multiple birds were seen on multiple days in 1988 at the same Myrtle Creek location, during a distribution study at inland California sites conducted by Pacific Southwest Range and Experiment Station (Paton and Ralph 1988, Paton and Ralph 1990). Sightings were approximately 10 miles (18.5 km) inland. Vegetation in this drainage is predominantly old-growth Douglas-fir and POC. Nearby old-growth redwood stands at Jedidiah Smith Redwoods State Park had higher activity levels. Surveys in the Myrtle Creek drainage were repeated in 1992, 1995, and 1996, with no detections. In 1992, an immature murrelet was found on the ground on private property near Panther Flat campground, approximately 15 miles (28 km) inland. There was no suitable nesting habitat near the bird, so it is not known where it came from (possibly blown off course during the large storm event the previous day). There were no other sightings on the Smith River NRA during survey efforts across the district between 1992 and 1996. In 1997, multiple sightings of MAMU occurred in old growth Douglas-fir and redwood forest in the Copper Creek drainage on the western edge of the Smith River NRA. In 2010 and 2011, radar surveys were conducted by ABR, Inc. Blaha and Cooper (2011) recorded 14 murrelet-like detections in 2010 and 17 murrelet-like detections in 2011 on the Smith River NRA. There were no audio-visual observations to confirm these, however, a suite of characteristics were used to minimize contamination of the dataset. These detections occurred in the Rowdy Creek drainage to the north and Blue Creek drainage to south. There have been no detections beyond the old-growth habitats on the western edge of the forest.

The entire Smith River Basin occurs within Zone 1 for the MAMU as described in the FEMAT Report. There are approximately 83,076 acres of potentially suitable MAMU habitat within the Smith River NRA, 9,894 in the North Fork, 23,346 in Middle Fork, and 49,836 in the South Fork sub-basins of the Smith. However, survey results show that key habitat areas appear to occur closer to the coast in old-growth (predominantly redwood) forests. Therefore, the suitable habitat available to MAMU may be less than what is estimated here. Redwood National and State Parks contain most of this key habitat remaining in the basin.

Marbled murrelet Critical Habitat was revised in 2009 with a final rule published on October 5, 2011 (USDI 2011). Located primarily on federal land, and to a lesser extent on State, county, city and private lands, this final Critical Habitat rule provides protection requirements under §7 of the ESA for federally regulated activities. There are 76,463 acres of MAMU Critical Habitat on the Smith River NRA. Marbled murrelet Critical Habitat is entirely within LSR boundaries.

Forest Service Sensitive

Bald Eagle

Nesting habitat is composed of low elevation, open (less than 40 percent canopy cover), mature/old-growth stands, near permanent lakes and free-flowing rivers. Nest trees are usually the largest in the stand, offer an unobstructed view of a body of water and are on prominent points of topography (USDI 1986). In California, 87 percent of nest sites are within 1 mile (1.6 km) of water (Zeiner et al. 1990). Platform stick nests are built in large trees (greater than 36 inches dbh) with open branches, but some foliage usually shades the nest (Anthony et al. 1982). Nests are usually located within the top 20 feet of the tree. Tree height, size, branch form and location appear to be more important than species. Adults use the same breeding territory, usually the same nest, year after year but may use alternate nest sites as well (USDI 2006).

Much of the forested land within one-quarter mile of the Smith River is potentially suitable bald eagle habitat. Eagles feed primarily on warm-water fish in the summer, salmon and carrion in the winter. They typically winter roost in groups of several individuals. The last known breeding record was in the early 1970s in the Rowdy Creek drainage, according to California Department of Fish and Wildlife records; however, bald eagles have been sighted in recent years during the breeding season. Subsequent surveys for nesting bald eagles have been sporadic and no nesting bald eagles have since been found on the Smith River NRA. A study evaluating the habitat suitability in Del Norte, Humboldt, Mendocino and Sonoma counties found that the Redwood State Parks in the Smith Basin offered the best overall combination of coastal nesting and foraging habitat in the entire study area (Detrich and Garcelon 1986). Other locations along the Smith also offered fair to good nesting opportunities. The limited nesting attempts in the Smith Basin may be tied to declining spring and summer anadromous fish runs.

Northern Goshawk

Goshawks appear to select habitat by forest structure rather than by tree species (Greenwald et al. 2005). Goshawks prefer mature and old-growth forests that are at middle to high elevations, have relatively dense canopy closures (greater than 40 percent), have usually little understory vegetation, are in close proximity to riparian corridors, and have flat or moderately sloping terrain (Crocker-Bedford and Chaney 1988; Zeiner et al. 1990 USDI 1998, Daw and DeStefano 2001). Adequate canopy cover appears to be critical for occupancy and productivity of nest sites. Canopy cover is likely used to protect chicks from predation and for thermoregulation.

In California, goshawks select ponderosa pine, mixed-conifer and mixed-conifer hardwood stands with trees that are greater than 20-inch dbh (Greenwald et al. 2005). Moderate and high quality habitats contain abundant large snags, logs and woody debris that provide prey habitat and plucking perches (Hall 1984, Weber 2006). Interspersed forest age classes, meadows or other openings near forested areas may be found within the home range and used for foraging. It has also been suggested that goshawks choose foraging sites based on prey availability (which relates to habitat structure and preferred foraging methods) rather than by prey abundance. Suitable habitat is used for nesting, foraging, and roosting.

Historically, there have been numerous sightings of goshawks on the Smith River NRA, with at least three reproductive territories known to occur. However, the most recent territory was discovered in 1992.

Comprehensive surveys of nest territories across the entire forest in 1994 and 1995 determined that none of the nesting territories, or any of the suitable habitat within a one-mile radius of the territories, were occupied. Additional surveys have been conducted on 45,000 to 50,000 acres (project-level surveys) with no detections. The status of the goshawk on the Smith River NRA is unknown at this time.

Goshawks occupy similar habitat to that of the northern spotted owl. There are approximately 90,754 acres of suitable habitat on the Smith River NRA.

Fisher

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

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

Thompson et al. (2007) determined that based on data from a 1994-1995 soot track plate study, 1996-1997 telemetry study and a 2002-2003 mark-site study, fishers appear to be abundant and well distributed across "the managed forests of extreme northwest California". An exact population estimate and distribution for the forest are still unknown.

Systematic surveys occurred across the forest in 1999 (Carroll, Zielinski, and Noss 1999) show the highest probability of detections centered on the Trinity River, with detection probability decreasing the farther north and south you go.

Survey results in the past indicate that the species occupies roughly 20 percent of its historical range in Washington, Oregon and California (USDI 2010). The population in the southern Oregon/northern California region may be the largest remaining in the western states (Zielinski et al. 2000, Powell and Zielinski 1994) with population estimates of 4,616 individuals (USDI 2010) and is critical to the restoration of fishers elsewhere in California and Oregon (Zielinski pers. com.).

Incidental fisher sightings have occurred on the Smith River NRA, during all months of the year. Track plate and camera surveys have been conducted across the district on numerous occasions since 1993. Numerous detections of fisher have occurred.

Fisher occupy similar habitat to that of the northern spotted owl. There are approximately 90,754 acres of suitable fisher habitat on the Smith River NRA.

Humboldt Marten

Humboldt martens (*Martes caurina humboldtensis*), a subspecies of Pacific marten, utilize old-growth Douglas-fir stands on non-serpentine soils and late seral stage mixed-conifer and Western white pine and lodgepole pine on serpentine soils (Slauson et al. 2009). Martens require a dense shrub layer (greater than 60 percent) in both habitat types for foraging and concealment from predators (Slauson and Zielinski 2009).

The first verified Humboldt marten in 50 years was detected in 1996 by Zielinski and Golightly on the Smith River NRA in Del Norte County. Since then, survey work has been conducted using track plates, baited photograph stations and radio telemetry to determine the size and range of the population. The current occupied area is 267 square miles extending from the mouth of Rock Creek on the Smith River in the Smith River NRA south to the Bluff Creek watershed on Orleans Ranger District, and east to the headwaters of Rock Creek drainage of the Klamath River in Siskiyou County (Slauson et al. 2009b). This area encompasses lands on the Smith River NRA, Orleans Ranger District, Ukonom Ranger District, redwood state parks and private timberlands.

Current population estimates by Slauson et al. (2009b) show a decline from 2000-01 surveys from approximately 60 individuals to approximately 40 individuals in 2008. These estimates were determined using a multi-state occupancy method utilizing detection data from 2000-01 and 2008 surveys. These surveys did not cover all possible habitat but the population is likely to be less than 100 individuals.

California Wolverine

In North America, wolverines occur within a wide variety of alpine, boreal, and arctic habitats, including boreal forests, tundra, and western mountains throughout Alaska and Canada. The southern portion of the species' range extends into the contiguous United States, including high-elevation alpine portions of Washington, Idaho, Montana, Wyoming, California, and Colorado (USFWS 2011). Wolverines do not appear to specialize on specific vegetation or geological habitat aspects, but instead select areas that are cold and receive enough winter precipitation to reliably maintain deep persistent snow late into the warm season (USFWS 2011). The requirement of cold, snowy conditions means that, in the southern portion of the species' range where ambient temperatures are warmest, wolverine distribution is restricted to high elevations, while at more northerly latitudes; wolverines are present at lower elevations and even at sea level in the far north (USFWS 2011).

Female wolverines use natal dens that are excavated in snow. Consistent snow cover greater than 5 feet deep appears to be a requirement for natal denning, because it provides security for offspring and buffers cold winter temperatures. Deep, persistent, and reliable spring snow cover (April 15 to May 14) is the best overall predictor of wolverine occurrence in the contiguous United States (USFWS 2011).

During the winter of 1993, the SRNF, in conjunction with the California Department of Fish and Wildlife and the University of California Berkeley, conducted a cooperative wolverine study on multiple forests and ownerships in potential or historic habitat areas using baited infrared camera stations. The forest's stations were located in areas with historic incidental sightings or in potentially suitable habitat. No wolverines were detected. In 1996 and 1997, a systematic track plate survey was conducted across the forest, also with no detections of wolverine. Since that time, numerous camera and track plate stations have been used across the Smith River NRA all without detections of wolverine.

There are no verified records of wolverine on the forest: however, incidental sightings of wolverines have been reported on the Smith River NRA. Most of the sightings occurred in the 1970s and 80s. Considering their need for persistent spring snow cover, preference for subalpine and alpine habitats or climatic conditions and their aversion to human disturbance, wolverines are only likely to occur on the Smith River NRA at higher elevation area in the Siskiyou Wilderness.

Pacific Western (Townsends) Big-eared Bat

The Townsends big-eared bat occurs in a variety of habitats, and is strongly correlated with the availability of caves or cave-like roosting habitat. It has been found from sea level to 8,700-foot-elevation (Humphrey and Kunz 1976, Kunz and Martin 1982, Pierson and Rainey 1994) and occurs in xeric to mesic habitats; although throughout much of its range it occurs in mesic habitats characterized by deciduous and coniferous forests (Kunz and Martin 1982). The species tends to avoid open grassland when foraging and flying to and from roost sites. In coastal California, they prefer riparian habitats near streams and small tributaries, foraging along the edge of the forest (Fellers and Pierson 2002). They have been observed at day roosts in cavities, created by decay or fire, of California bay (*Umbellularia californica*) and redwood. Because of this, it is difficult to define measurable habitat variables. The most limiting factor appears to be availability of suitable roost sites. They will use cave, mines and abandon buildings for maternity roosts and hibernacula, and have been known to use abandon bridges and large tree cavities for day and night roosts (Idaho State Conservation Effort 1995). They do not roost in crevices but rather on exposed surfaces, often close to the entrance of the cave making them extremely vulnerable to disturbance and may abandon a site with one human entry (Pierson et al. 1991). Factors in the decline of the species are disturbance, pesticide use, habitat loss, and roost destruction (Idaho State Conservation Effort 1995).

Little is known on the species abundance and distribution, although potentially suitable roost sites exist within the Smith River NRA. This species is known to roost in caves, mineshafts and abandoned buildings. No surveys have been conducted for this species; however, incidental sightings have been recorded.

Fringed Myotis

The fringed myotis is rare across its range but may be quite common locally from sea level to 1,950 meters (6,400 feet). It occurs in a wide range of habitats from desert scrub to high elevation coniferous forests (Pierson and Rainey 1998). It uses open habitats, early successional stages, streams, lakes and ponds as foraging areas. They roost in snags, caves, mines, crevices and man-made structures (Zeiner et al. 1990).

Maternity and overwintering roosts have been most commonly reported in caves, buildings and mines. However, tree roosting has been observed in heavily forested environments in the northern part of the range (Pierson and Rainey, 1998).

Like other tree-roosting Myotis species, the fringed myotis switches roosts less than every two days on average (Weller and Zabel 2001) and requires a large number of suitable roost sites in an occupied area. Roost choice appears to vary throughout the range of the fringed myotis with snags exhibiting greater importance in California, New Mexico and Arizona and a heavy reliance on rock crevices in South Dakota, Oregon and Washington (Lacki and Baker, 2007). Weller and Zabel (2001) found that fringed myotis prefer large (greater than 30 cm dbh) snags in decay class 2 or 3 that are the tallest in the stand and have reduced canopy cover (necessary for thermoregulation). This is consistent with the few snags reported by Lacki and Baker (2007) who also found that female the fringed myotis in arid climates used rock crevices that were 1 to 4cm wide and located in non-forested areas. It is unclear if the fringed myotis actually prefers rock crevices in these areas or if there is a deficient amount of quality snags.

Little is known on the species abundance and distribution, although potentially suitable roost sites exist within the Smith River NRA. This species is known to roost in caves, mineshafts and abandoned buildings. No surveys have been conducted for this species; however, incidental sightings have been recorded.

Foothill Yellow-legged Frog

The yellow-legged frog occupies larger streams and rivers, typically on the edges of rocky pools formed during low water. This species is most common in streams that have a rocky or gravelly substrate, that are large enough to develop bar and backwater habitat (Jones et al. 2005). There are numerous sighting records of yellow-legged frogs within the Smith River NRA. The frog is found in most of the tributaries to the Smith, and has been frequently been recorded during herptile and fisheries surveys.

Western Pond Turtle

Turtles are often concentrated in low gradient and low velocity sections of creeks and rivers, especially in sloughs, side channels, and backwater areas. They prefer creeks that have deep, still water and sunny banks. They utilize a variety of upland habitats for overwintering as well as the network of creek, ponds, and ephemeral bodies of water associated with riverine systems (Reese and Welsh 1997, Bondi 2009). Hatchlings are small and cryptic, and require shallow, edge water areas with minimal currents. Adults concentrate in deep-water pools with lots of underwater debris (USDA 2013). The pond turtle has been sighted in the Smith River estuary and Lower Smith River, but there have been no sightings anywhere else on the Smith River. There have been no surveys conducted for the specifically for turtles, however, there is little suitable habitat for the species on the Smith River NRA, due to the geology and geomorphology of the Smith River.

Northern Red-legged Frog

Red-legged frogs are inhabitants of moist forests and riparian areas usually below 2,876 feet (850 meters) in elevation. They are generally found near permanent bodies of quiet water including small ponds, quiet pools along streams, springs, lakes, and marshes (Nussbaum et al. 1983, Stebbins 2003). Deep pools are necessary for many aspects of the red-legged frogs' life cycle. Intermittent streams and pools must retain water long enough for larvae to metamorphose. Red-legged frogs require cool water. The northern red-legged frog has the lowest upper (21ºC) and lower (4°C) lethal embryonic temperatures of any North American ranid frog.

Red-legged frogs require dense riparian vegetation that is contact with, or close to water 2.3 feet (0.7 meters) or greater in depth (Hayes and Jennings 1988). At sites with adult red-legged frogs, vegetation typically shades a substantial portion of water surface area right at or near water level (ibid.)

Habitat for this species is limited on the Smith River NRA. Incidental sightings have been recorded in the northwestern edge of the Smith River NRA and the Yurok Experimental Forest.

Southern Torrent Salamander

This species is found from near sea level to 4820 feet in elevation (Welsh and Lind 1996). Preferred habitat is described as cold, permanent seeps and small streams with a rocky substrate (Jennings and Hayes 1994). Welsh and Lind (1996) found that this species is associated with cold, clear headwater to low-order streams with loose, coarse substrates in humid forest habitats with large conifers, abundant moss, and greater than 80 percent canopy cover. These conditions are mostly found within late seral stage forests.

Little is known on the species abundance and distribution, although suitable habitat exists within the Smith River NRA. This species has been recorded during herptile and fisheries surveys.

Mardon Skipper

The mardon skipper inhabits early seral stage open grasslands that are dominated by short-statured grasses or sedges and forbs and are generally free of overstory trees and shrubs. Areas as small as 0.5 acres will support small populations of mardon skippers but most areas consist of mixed forest-grassland complexes with some connectivity between habitat patches for dispersal and movement of individuals. In northwestern California and southwestern Oregon, mardon skipper is found in small meadows (0.5 to 5 acres) dominated by Idaho fescue in sparse Jeffrey pine forests. Sites are 7 to 15 miles inland from the Pacific coast and range in elevation from 1,500-3,000 feet. These sites are associated with serpentine-based soils and are within the fog belt (USDI 2012).

The mardon skipper was petitioned for listing in 2002 and placed on the candidate list as *warranted but precluded* (evaluation delayed due to limited funding that was dedicated to court-ordered or higher priority listings). On September 4, 2012, the USFWS released a 12-month finding which determined that listing was not warranted at this time. An increased survey effort from 2003 to 2011 found an additional 165 sites, which was a dramatic increase from the 14 documented sites in the 2002 petition.

There are two main population sites on the Smith River NRA, each containing multiple meadows. One of the sites is believed to be the largest population in California based on a one-day count of 204 individuals in 2008 (Black and Mazzacano 2010). Monitoring at these sites over the last 5 years indicates that populations at the sites on the Smith River NRA appear to be stable.

Western Bumblebee

Western bumblebees require open meadows with rich supplies of floral resources with continuous blooming from spring to autumn. Western bumblebees have been observed taking nectar from a variety of flowering plants.

Historically the western bumblebee ranged from central California north to Alaska, east through Alberta and western South Dakota and southward into Arizona and New Mexico. Surveys in 2007 found isolated populations in northern Arizona, Utah, Nevada and northern California. The species has declined dramatically in the west (Washington, Oregon, California, British Columbia and Alaska) since the mid-1990s with most areas seeing a complete absence of the species from 2002 to 2007. Although the general distribution trend is steeply downward, especially in the west coast states, some isolated populations in Oregon and the Rocky Mountains appear stable (Rao et al. 2011, Koch and Williams 2012). The overall status of populations in the west is largely dependent on geographic region: populations west of the

Cascade and Sierra Nevada mountains are experiencing dire circumstances with steeply declining numbers, while those to the east of this dividing line are more secure with relatively unchanged population sizes. The reasons for these differences are not known.

Probable causes for the population decline include the spread of *Nosema bombi* and other diseases from *B. occidentalis* and *B. impatiens* colonies that were raised in Europe and then shipped back to the US and used commercially, loss of genetic diversity, livestock grazing, urban development, habitat fragmentation, habitat encroachment due to fire suppression and pesticide use (Thorp et al. 2008).

There is little information regarding the western bumblebee on the forest. Until recently nearest confirmed detections were of two workers in 1997 in the Marbled Mountain Wilderness on Klamath National Forest. In 2014 and again in 2015, two western bumblebees were detected on Route 1 near Horse Mountain on the Lower Trinity Ranger District.

Management Indicator Species

Per the requirements in 36 CFR 219, the Forest Plan identified MIS to be used in forest-level planning. These species were selected because their population changes were believed to indicate the effects of management activities on fish and wildlife populations.

Under the Forest Plan, project level analysis of effects to MIS involves an analysis of the effects (direct, indirect, and cumulative) to habitat. The Forest Plan does not require population monitoring or surveys at the project level. Project-level impacts to habitat are then related to broader scale (generally forest, and in some cases, bioregional) population and/or habitat trends.

The Smith River NRA is diverse in both its geology and vegetation. Many habitat-types occur throughout the basin. These include small lakes, bogs, seeps, springs, talus slopes, meadows, caves, cliffs, and hardwood stands.

Bog/Seep/Spring/Wet Meadow Assemblage

There are 15 wet meadows, 19 springs, and 5 bogs that are known to occur within the Smith NRA. Southern torrent salamanders are known to occur in the watershed. It is likely that other suitable habitat for this species remains unmapped. Special microhabitat characteristics are required by the species dependent on these habitat types. Most are especially sensitive to variations in water temperature, chemistry, siltation levels, adjacent forested habitats, down woody debris, and disturbance.

Snag Assemblage

Snag density estimates are based on ecology plot and ecological unit inventory information for series and seral stages across the forest. Jimerson (1989) found snag densities within the Smith River NRA varied by size class and conifer series; however, this difference was not statistically significant for all categories. Snag densities per acre are as follows (Table 3-154):

Table 3-154. Snag densities per acre by series and size class.

Series	Small	Medium	Large
Tanoak/Douglas-fir	13.64	1.6	1.57
Port-Orford-cedar	25.00	2.86	3.07
White fir	26.86	2.57	2.31
Red fir	40.32	3.36	2.48

Large snags are defined as greater than or equal to 20 inches dbh and greater than 50 feet tall. Medium snags are defined as greater than or equal to 20 inches dbh and from 20 to 50 feet tall. The small snag category includes all other snags.

All the species in the assemblage are known to occur in the watershed except the white-headed woodpecker.

Marsh/Lake/Pond Assemblage

There are 32 ponds, 7 lakes, 2 vernal pools, and 24 man-made ponds located throughout the Smith River NRA. All three species of this assemblage are known to occur in the watershed, however the pond turtle has only been found in the Smith River Estuary and Lower Smith. Special microhabitat characteristics are required by the species dependent on these habitat types. As with other aquatic species, all are extremely sensitive to any changes in microhabitat temperature, chemistry or siltation levels.

River/Stream/Creek Assemblage

There are approximately 3,100 miles of streams within the Smith River NRA. The amount of suitable habitat for this assemblage varies between and within drainages. All the species in this assemblage are known to occur in the watershed. These species are also sensitive to variations in microhabitat conditions.

Downed Woody Debris Assemblage

There is approximately 255,472 acres of potentially suitable habitat for this assemblage in the Smith River NRA. The model is based on the size and density of downed woody debris in two different decay classes, (as well as vegetation and seral stage for the dusky-footed woodrat): decay class 1 or 2 with greater than 2 logs per acre (20-inch bottom diameter and 30-foot length) or decay class 3 to 5 with greater than 1 log per acre (12-inch bottom diameter and 20-foot length). The information on log densities is based on expected densities per series/seral stage and therefore may over-estimate the number of acres providing adequate habitat. In addition, the number of acres meeting both decay class requirements is unknown, but it is unlikely that all the potential acres meet both requirements.

There are no detections of arboreal salamanders and only a single detection of a clouded salamander (unverified) within the watershed, despite extensive surveys for herptile and mollusk species. Dusky footed woodrats have been detected numerous times during track-plate surveys. Blue grouse (now known as the sooty grouse) and western fence lizard are also common in the watershed.

Black Oak/White Oak Assemblage

There are less than 500 acres of black oak/white oak stands on the Smith River NRA. It is unlikely that this small, isolated amount of habitat supports populations of the species listed in the assemblage. All the species have been sighted on the Smith River NRA, although most are uncommon on the Smith River NRA.

Tanoak/Madrone Assemblage

Tanoak and Pacific madrone are common components of the Douglas-fir/mixed evergreen type. Tanoak is valuable to wildlife because it produces acorns and has a greater abundance of natural cavities compared to conifers. Madrone produce berries, which provide an important food source for wildlife, particularly in the fall. It also frequently used as a nest tree by cavity excavators. There are 119,795 acres of this habitat type in the Smith River NRA. Tanoaks need to be mature (30 to 40 years of age) before they can produce acorns, therefore the analysis included the early-mature to old-growth seral stages. All three species of this assemblage occur on the Smith River NRA.

Individual Species

Individual MIS include the NSO, marten, fisher, pileated woodpecker, black bear, and black-tailed deer. The NSO, marten and fisher were addressed above under threatened and Forest Service Sensitive species.

Pileated Woodpecker

Pileated woodpecker occupies dense, mature forests with large numbers of snags, stumps, and logs for cover, and prefers areas with at least 40 percent canopy cover; it frequents Douglas-fir, white fir, and red fir more than other conifers (CWHR 2008). It may also use younger forests that have scattered large dead trees (Bull and Jackson 1995). Pileated woodpecker prefer multi-storied mature and late-successional conifer forests with moderate to dense canopy closure, and scattered patches of large snags and downed logs. This species forages primarily in dead wood, therefore both standing snag and downed log densities are important indicators of habitat quality (USDA 2009). There are 92,051 acres of potentially suitable habitat for this species within the watershed. Snag estimates per seral stage may over-estimate the actual amount of habitat capable of supporting pileated woodpeckers. There are numerous sighting of this species on the Smith River NRA.

Black-tailed Deer

The black-tailed deer is a widespread, common to abundant resident distributed throughout most of California, except in deserts and intensively farmed areas without cover (Ingles 1965, CWHR 2008). The species occurs in early to intermediate successional stages of most forest, woodland, and brush habitats. Habitat preferences include a mosaic of various-aged vegetation that provides woody cover, meadow and shrubby openings, and free water.

The Six Rivers is located within North Coast Management Unit (DAU-1). Black-tailed deer populations on are monitored by California Department of Fish and Wildlife (CDFW). The CDFW has noted that the North Coast Management Unit is the most productive in terms of deer per square mile. The deer population has been considered stable in recent years with population surveys yielding census counts from 170,000 to 250,000 individuals.

A deer herd management plan for the Smith River deer herd was developed by the Department of Fish and Wildlife in 1984. The plan identified population goals, key wintering and fawning areas, and management for these critical areas. The population at that time was estimated to be close to 3,200 animals. The Patricks Creek and Big Flat areas were identified as key habitat areas.

Black Bear

The black bear is a widespread, common to uncommon resident occurring from sea level to high mountain regions. The black bear occurs in dense, mature stands of forest habitats, and feeds in a variety of habitats including brushy stands of forest, valley foothill riparian, and wet meadow. This species requires large trees and various cavities and hollows in trees, snags, stumps, logs, uprooted trees, talus slopes, or in the earth for denning. These habitat elements must be in mature, dense vegetation, and on sheltered slopes for adequate denning (CWHR 2008).

The black bear was selected as a MIS because of its habitat association with mid and late-successional stages of all forest vegetation types, meadow types, and its large down log requirements. The CDFW monitors black bear populations within northwestern California. The CDFW estimates the population in 2012 to be approximately 25,000 to 30,000 animals and reports the population to be increasing, which is reflected in the increase of bear tags being issued in recent years. The northern portion of California is continually noted by CDFW as supporting the highest density of bears of any area within the western United States. Black bear are commonly sighted on the Smith River NRA.

Survey and Manage Species

The S&M standards and guidelines were developed to benefit species closely associated with late-successional and old-growth forests. Species include plant (vascular and non-vascular), fungi, terrestrial mollusk, aquatic mollusk, and vertebrate species. The S&M provision for each species would apply to the range (or portion of the range) of that species, to the particular habitats where concerns exists for species' persistence, and where management activities are considered *habitat disturbing* for that species (USDA/USDI 2001). Projects are not considered habitat disturbing if they do not occur in potential habitat for the species being considered or if they occur in previously disturbed areas. Projects are exempt from pre-project surveys if the project will not disturb potential habitat.

In addition, pre-project surveys are not required when the Pechman exemptions apply; which are provisions ordered by the court in *Northwest Ecosystem Alliance et al. v. Mark E. Rey et al.*, No. 04-844P, (W.D. Wash. October 10, 2006). Pre-project surveys are not required in the following situations:

- Thinning projects in stands younger than 80 years old;
- Replacing culverts on roads that are in use and part of the road system, and removing culverts if the road is temporary or to be decommissioned;
- Riparian and stream improvement projects where the riparian work is riparian planting, obtaining material for placing in-stream, and road or trail decommissioning; and where the stream improvement work is the placement of large wood, channel and floodplain reconstruction, or removal of channel diversions; and
- The portions of projects involving hazardous fuel treatments where prescribed fire is applied. Any portion of a hazardous fuel treatment project involving commercial logging will remain subject to the S&M requirements except for thinning of stands younger than 80 years old under subparagraph a. of this paragraph.

Neotropical Migrant Bird Species

The Forest Plan meets the objectives of maintaining wildlife populations by providing the variety, distribution and amount of wildlife habitat types necessary to achieve this goal. Implementation of the project is in accordance with the objectives within Executive Order 13186, which outlines responsibilities of federal land management agencies to the Migratory Bird Treaty Act.

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.

Other Species of Concern/Interest

Elk

Roosevelt elk inhabit old-growth forest, semi-open forests with patches of meadows (Schroer et al. 1986), and prairies and grasslands (McCoy 1986, Grenier 1990). Although now found in significant numbers, the Roosevelt Elk (*Cervus canadensis*) approached extinction in the early 20th century, with no more than a few dozen animals in California. Roosevelt elk were extirpated from the Smith River NRA in the early 1900s due to over-hunting for mining camps. Elk have gradually recolonized the coastal areas and now occur in numbers where CDFW is allowing limited hunting. Limited sightings of elk have occurred on the Smith River NRA, although the herd has not yet reestablished consistent use areas.

Environmental Consequences

Effects Common to All Species Groups

Motor vehicle use of roads and trails affects wildlife, directly and indirectly, in a variety of ways that can generally be placed into three categories: effects resulting from human-caused injury or mortality; effects resulting from changes in behavior (disturbance-based); and effects resulting from habitat modification or loss.

Direct effects due to disturbance include causing individuals to move or alter behavior. Species could be disturbed during the breeding or nesting season. Disturbance could lead to reduced time on the den or nest, thereby threatening eggs, or young, with exposure. Disruption of foraging activities of nocturnal species is considered to be unlikely, since most vehicle use occurs during daylight hours. Use of routes near occupied sites could affect reproductive functions. Summer et al. (2011) found that traffic noise is not the main cause of the negative relationship between bird species richness/abundance and proximity to road but rather that traffic mortality may be the main mechanism causing the reduction.

Hayward et al. (2011) examined the effects of acute OHV use on the northern spotted owl by measuring hormone levels. Prolonged (1 hour or more of motorcycle exposure simulating *Enduro* events) was found to increase stress hormones in the short term, although results varied with the age, sex, and body condition of the owls. Hayward et al. (2011) also found that the tendency for traffic exposure to increase stress hormones over the long-term was offset by nutritional gains associated with proximity to roads. Northern spotted owl close to noisy roads fledged significantly fewer young than northern spotted owl near quiet roads, indicating that routine traffic exposure may decrease northern spotted owl reproductive success over time; however, the relationship of stress hormones to body condition indicated that impacts from roads may be lessened when habitat quality is higher. It is important to note that areas that would be suitable for OHV or Enduro events (loop routes or long trails) are very limited on the Smith River NRA, and do not occur in suitable late-successional species habitats. Speeds of vehicles on the Smith River NRA traveling on ML 2 roads and motorized trails are generally low. The potential for human-caused injury or mortality from this type of vehicle use is limited.

Effects to a species may occur as a result of noise disturbance when vehicle activity occurs within suitable habitat or adjacent to known sites. Effects due to noise disturbance are not expected in areas where noise levels generated by the project do not exceed ambient levels. Many UARs (especially short routes leading to dispersed recreation sites) are associated with designated ML 2 or ML 3 roads, which receive regular motorized use, and individuals using habitat within 0.25 miles of these roads are expected to be habituated to vehicle noise. In addition, all UARs have received some level of repeated motorized use for years. Noise associated with motorized use of these routes is considered ambient.

A review and synthesis of the scientific information regarding noise disturbance and avian species completed by the USFWS indicates that the likelihood of noise-generating activities adversely affecting northern spotted owls and marbled murrelets is a function of activity-generated noise levels relative to pre-project noise levels (USDI 2006). When project-generated noise levels reach or exceed a threshold noise level above ambient noise level, an individual may respond with an adverse behavioral response, physiological responses, or both. Research indicates that spotted owls may flush in response to noise generated within 200 feet, but almost never flush at longer distances (Delaney et al. 1997). Data also suggest that continued presentation of noise disturbance might cause birds to habituate to some types of noise. Research indicates that stress hormones increased in male northern spotted owls when they were located less than 0.25 mile from major logging roads (Wasser et al. 1997); however, Temple and Gutierrez (2004) found no evidence of an adverse road effect on spotted owl fecal corticosterone levels. Long-term effects from elevated stress hormones are unknown, but physical condition or reproductive success may be compromised (Marra and Holberton 1998, in Gaines et al. 2003). Delaney et al. (1999) corroborates the USFWS recommended 400 meter (0.25 miles) zone around spotted owl nest sites as a reasonable distance for evaluating significant effects for noise disturbance activities. There are few data available to indicate how, or to what degree, other late-successional forest species are affected by noise disturbance, although anecdotal information suggests they are fairly tolerant of chronic (ongoing or ambient) noise and less tolerant of acute (sudden or unexpected) noise. Zielinski et al. (2008) found that OHV use does not affect marten distribution or habitat occupancy. Grub et al. (2012) found no evidence of any negative effects of logging truck noise on nesting northern goshawks and that all tested pairs successfully fledged young. Summer et al. (2011) found that traffic noise is not the main cause of the negative relationship between bird species richness/abundance and proximity to roads. Due to lack of data on other species, the 0.25 miles effects zone for noise disturbance used for northern spotted owl will be utilized for this group as a whole.

Road and route densities are an important variable in habitat capability models. For certain species, the Forest Plan describes desired road densities to achieve certain levels of habitat capability. For fisher, road density of less than 0.5 miles of road per square mile is considered high capability and from 0.5 to 2 miles per square mile is consider moderate capability. For marten, less than 1 mile per square mile is considered high capability and from 1 to 2 miles per square mile is consider moderate capability. Less than 1.5 miles per square mile is considered to provide high capability for black tailed deer, and 1.5 to 3 miles per square mile is considered to provide moderate capability. Anything over 2 to 3 miles per square mile, depending on the species, is low or marginal capability.

Threatened and Forest Service Species

Direct, indirect and cumulative effects to threatened and Forest Service Sensitive wildlife species are disclosed in the biological assessment/evaluation (BA/BE) for this project, (located in the project file) and the results are summarized here. The BA/BE contains the list of species considered and suitable habitat descriptions on which effects of proposed projects are evaluated.

All action alternatives will reduce road densities of ML 1, 2 roads and UARs across the Smith River NRA. Reducing road density across the district will reduce fragmentation of habitat as the decommissioned roads revegetate, increase patch size, reduce sedimentation in stream channels, and reduce disturbance and direct mortality. In addition, cross-country travel is prohibited under the Smith River NRA Act of 1990. An overall reduction of road densities across the Smith River NRA will benefit wildlife in the short-term through elimination of noise disturbance on closed roads/routes and in the long-term through the reduction of fragmentation and habitat restoration. The project will benefit threatened or Forest Service Sensitive species.

Management Indicator Species, Neotropical Migrant Species, Survey and Manage Species, and Other Wildlife Species of Concern

The direct, indirect, and cumulative effects to MIS, NTM, and S&M species were analyzed in project specialist reports for this project (located in the project file) and the results are summarized here. The proposed project complies with these standards and guidelines set forth in the Forest Plan for MIS, NTM, S&M species, and other wildlife species.

No construction or reconstruction will occur under this project; therefore, no changes in the distribution or abundance of habitat available to MIS, NTM, and S&M species are anticipated. All action alternatives will reduce road densities of ML 1, 2 roads and UARs across the Smith River NRA. Reducing road density across the district will reduce fragmentation of habitat as the decommissioned roads revegetate, increase patch size, reduce sedimentation in stream channels, and reduce disturbance and direct mortality. In addition, cross-country travel is prohibited under the Smith River NRA Act of 1990. An overall reduction of road densities across the Smith River NRA will benefit wildlife in the short-term through elimination of noise disturbance on closed roads/routes and in the long-term through the reduction of fragmentation and habitat restoration. The project will benefit MIS, NTM, and S&M species, and other wildlife species.

Alternative 1 – No Action

Direct and Indirect Effects

Under the No Action alternative, there would be no reduction in road density across the district, and no habitat restoration would occur for threatened or Forest Service Sensitive species, MIS, NTM, S&M species, and other wildlife species from decommissioning roads and restoring UARs. Disturbance and direct mortality from on-going road use would not be eliminated, as no roads/routes would be removed. Sedimentation into streams would not be reduced.

The No Action alternative will not remove any habitat at culvert sites on roads to be decommissioned or restored; therefore, there will be no short-term habitat degradation. No noise disturbance would occur from decommissioning/restoration activities during the breeding season.

Cumulative Effects

The No Action alternative will not provide beneficial cumulative effects because no road reduction or restoration activities would occur. The No Action alternative will continue to degrade conditions for sensitive resources.

Alternative 4

Direct and Indirect Effects

Changes between the draft and final EIS for Alternative 4 include adding seasonal and year-round gates, changing barricades to year-round gates, replacing the 18N07 Griffin Creek Bridge, removing seasonal gates that were determined to be in low risk areas or were already closed by another gate elsewhere, downgrading two roads from ML 3 to ML 2, decommissioning additional ML 1 roads, and designating two UARs as motorized trails.

Changing barricades to gates, downgrading ML 3 to 2, or changing ML 1 roads to decommissioning will not change the level of use; therefore, will not change the effects on listed and Forest Service Sensitive species. The current level of use of the roads to be downgraded is expected to continue. ML 1 roads are closed to traffic and are allowed revegetate; therefore, there will be no use on either ML 1 or decommissioned roads. Future use of ML 1 roads will require additional NEPA analysis before they can be opened for use. The Griffin Creek Bridge is the access point from US Highway 199, and construction will not increase the amount of noise disturbance in the area. The two UARs to be added as motorized trails occur in serpentine habitats that are not suitable for any threatened or Forest Service Sensitive species.

None of the changes made to Alternative 4 between the draft and final EIS change the level of impact or effects to threatened, or Forest Service Sensitive species. There will be no additional impacts to habitat for MIS, NTM, or S&M species.

Alternative 4 of the Smith River NRA travel management project will remove 135.93 miles of road/routes and reduce road density across the Smith River NRA. Alternative 4 will reduce overall ML 1, 2 road and UAR miles on the Smith River NRA by 21 percent (Table 3-155). Road density will be reduced across the district, varying from 0.3 miles per square mile to 1.3 miles per square mile depending on the 5th-field watershed (Table 3-156). Three routes (0.42 miles total) will be added within late-successional habitat. These sites are dispersed camping sites that have been in use for many years. No UARs will be added within 0.25 miles of known threatened or Forest Service Sensitive species nest or other Sensitive sites. Approximately 146 (83.4 miles) NFTS roads/UARs will be removed (decommissioned or restored) from within known NSO territories.

Table 3-155. Comparison of alternatives in regards to effects to wildlife.

Indicator	Alt 1	Alt 4	Alt 5	Alt 6
Miles/number of routes of UAR added in late successional habitat.	0	0.42 mi (3 routes)	0	0.16 mi (3 routes)
Miles of UAR added in within 0.25 mile of known threatened or Forest Service Sensitive species nest/den or sensitive sites.	2.41 (existing)	0	0	0
Miles/number of routes of UAR added in LSRs/MAMU Critical Habitat.	0	2.1 (6)	0.24 (2)	1.93 (8)
Miles/number of routes of UAR added in NSO Critical Habitat.	0	2.31 (6)	1.74 (1)	1.92 (5)
Miles/number of routes system roads and UAR decommissioned/restored in LSRs and MAMU Critical Habitat.	0	50.48 (98)	60.13 (112)	60.13 (112)
Miles/number of system roads and UAR decommissioned/restored in northern spotted owl Critical Habitat.	0	45.3 (91)	52.1 (97)	52.1 (97)
Miles/number of system roads and UAR decommissioned/restored in NSO territories.	0	83.4 (146)	105.58 (174)	80.39 (157)
Total percent restored/decommissioned/downgraded to ML 1.	0	21%	47%	40%

Unauthorized routes are proposed to be added to the system within LSR/MAMU Critical Habitat units (6 routes for a total of 0.2 miles) and NSO Critical Habitat (6 route for 2.31 miles). None of the roads to be added to the system occur in suitable nesting/denning habitat for the MAMU, NSO, or other late-successional habitat species. A total of 98 roads/roads/routes (50.48 miles) will be removed from LSR/MAMU Critical Habitat units and 91 roads/routes (45.3 miles) will be removed from NSO Critical Habitat units under this alternative.

Road Density

Alternative 4 reduces road density in all 5th-field watersheds (Table 3-156). None of the 5th-field watersheds exceeds 3 miles per square mile. All alternatives are less than 2 miles per square mile.

Table 3-156. Road density by 5th-field watershed of the Smith River basin.[59]

5th-Field Watershed	Road Density (mi/mi²)			
	Alt 1	Alt 4	Alt 5	Alt 6
Lower Smith River	0.58	0.41	0.22	0.37
Middle Fork Smith River	1.62	1.30	1.05	1.25
North Fork Smith River	0.42	0.30	0.15	0.24
South Fork Smith River	1.12	0.86	0.58	0.80

[59] Includes road miles on non-Forest Service lands.

Depending on the species, moderate to high capability is maintained in all watersheds (all alternatives are less than 2 miles per square mile), for the fisher and marten (Forest Plan FEIS (1995) Appendix B, pp. B-53 and B-56).

No new road construction or reconstruction will occur under as part of this project and only minor expansion of existing open areas (brush removal) will occur under Alternative 4 to allow parking along 17N49, which does not occur in potential habitat for any wildlife species of concern. Therefore, no NSO or MAMU Critical Habitat will be removed through road construction and no suitable habitat will be removed for any threatened or Forest Service Sensitive species, MIS, NTM, S&M species, or other wildlife species. Culvert removal on roads/routes to be decommissioned or restored may require minor amounts of brush and smaller diameter trees (saplings up to 11-inch dbh) to be removed at culvert inlets and/or outlet (usually 0.1 acre or less); however, the removal will be negligible in any one area. Approximately 82 culverts would be removed across the district under Alternative 4; therefore, approximately a total of 8 acres of vegetation may be removed. This is an overestimate of the amount of vegetation to be removed in that not all culverts sites have been brushed in, the roads may occur in naturally open areas, or the amount of vegetation to be removed is less than one-tenth of an acre.

Suitable habitat for threatened or Forest Service Sensitive species may be degraded by removing understory vegetation for late-successional species such as the NSO, but impacts are negligible in any one area (one-tenth acre or less) and the habitat will remain suitable post-project.

Minor vegetation removal at culvert sites may degrade suitable habitat for MIS and NTM species, and other wildlife species by removing habitat for early-seral habitat species such as the winter wren; however, the removal will be negligible in any one area (one-tenth acre or less). Culvert removal activities could also affect Forest Service Sensitive species and MIS such as the yellow-legged frog and southern torrent salamander from heavy equipment use in the channel during project implementation; however, channel restoration will benefit aquatic species in the long term.

Primary constituent elements of the 2012 NSO Critical Habitat units include forested stands that qualify as nesting/roosting, foraging, or dispersal habitat. One-tenth acre of brush and small diameter trees will be removed in any one area. Impacts to NSO Critical Habitat units will be negligible. Although multi-layered conditions contributing to nesting/roosting and foraging habitat may be slightly reduced by removing brush and understory trees less than 11-inch dbh, it will result in a reduction of fragmentation and long-term improvement of primary constituent elements in the critical habitat units. Northern spotted owl Critical Habitat units primary constituent elements may be modified but the effects will be negligible in any one area and current habitat function will be maintained in all treatment areas.

Primary constituent elements of MAMU Critical Habitat units include: 1) individual trees with potential nesting platforms, and 2) forested areas within 0.5 miles of individual trees with potential nesting platforms, and with a canopy height of at least one-half the site-potential tree height. Saplings (up to 11-inch dbh) that could be removed at culvert removal sites are not considered as primary constituent elements. The project will not change the function of nesting habitat in MAMU Critical Habitat units.

Due to different habitat requirements, not all culvert sites occur in suitable or critical habitat for all threatened or Forest Service Sensitive species, MIS, NTM, and other wildlife species; therefore, 8 acres of habitat degraded under this alternative greatly overestimates the amount of habitat potentially affected for any one species.

High priority roads determined to have a high risk to aquatic resources will need to have the restoration work accomplished during the breeding season of the NSO, MAMU and Forest Service Sensitive species such as the fisher, marten and northern goshawk. Work on these roads will include decommissioning and upgrading. Delaying implementation until after the breeding season would mean that the project would require multiple years of work on the same road, which greatly increases the cost of the work as well as increasing risk to aquatic resources. Therefore, no limited operating period will be imposed on activities proposed for these roads except for within 0.25 miles of a known NSO nest sites, occupied MAMU site, or active Forest Service Sensitive nest/den. Not all the high-risk roads or all segments of each road are within 0.25 of suitable habitat for these species. Several roads are within the US Highway199 corridor, and have high ambient noise levels. Others occur in unsuitable habitat. There are 76 high-risk roads to be removed or upgraded, 70 of which occur, at least partially, in unsurveyed suitable nesting habitat for NSO, MAMU, and Forest Service Sensitive species. Of these, 43 will be decommissioned or downgraded to ML 1 (culverts removed and drainage issues corrected) and 33 will be upgraded (larger culverts installed and drainage issues corrected) under Alternative 4.

Conclusions

Alternative 4 of the Smith River travel management project was determined to have minimal habitat effects (maximum 8 acres across the district at culvert removal sites) with long-term benefits of reducing road density across the district.

Alternative 4 would result in a 21 percent reduction of ML 1 and 2 roads, and UARs across the Smith River NRA, which will benefit wildlife in the short-term through elimination of noise disturbance on closed roads/routes and in the long-term through the reduction of fragmentation and habitat restoration.

Endangered Species Act Determination:

Implementation of Alternative 4 during the breeding season will cause noise disturbance for the NSO and MAMU. The project is likely to adversely affect the NSO and MAMU, in the short term from noise disturbance during the breeding season but will have long-term beneficial effects through the reduction of road density. The project is not likely to adversely affect NSO Critical Habitat through minor habitat removal at culvert sites, and is expected to improve habitat conditions in the long term through the reduction of road density. The project will have no effect on marbled MAMU Critical Habitat.

Alternative 4 may impact individuals but will not cause a trend towards listing for any Forest Service Sensitive species.

Alternative 4 complies with the Forest Plan in regards to the analysis of effects to MIS, NTM, S&M species, and other wildlife species.

Cumulative Effects

The list of past, present and reasonably foreseeable projects that were considered in the analysis of cumulative effects to wildlife species can be found in Appendix C. The project encompasses the entire

Smith River NRA extended to include extended to include all NSO territories affected by project; therefore, the action area is 367,368 acres and defines the context of the analysis.

Regarding all the past impacts from land uses (mining, timber harvest, road constructions), all action alternatives will reduce the current effects from old failing roads, and will accelerate the recovery rate of disturbed areas and facilitate restoration by reducing road density across the action area. The beneficial cumulative effects include the reduction of habitat fragmentation for threatened, Forest Service Sensitive, MIS, and NTM species, and other wildlife species including reducing road-related disturbance and mortality for wildlife, increasing POC protection (important riparian canopy species, especially in serpentine areas), and reducing the extent of hydrologic connectivity and road-related sedimentation to aquatic species habitat. All action alternatives are beneficial to sensitive resources when compared the cumulative effects from past actions.

The trend for wildlife habitats on the Smith River NRA is towards recovery. Since the 1990 Smith River NRA Act, timber harvest on the Smith River NRA has been limited and geared towards habitat restoration (thinning in younger stands). Fuel treatments have been developed to help restore natural fire regimes and to protect existing habitats. Since the Smith River NRA Act in 1990, 884 acres have been thinned using silvicultural prescriptions designed to accelerate the development of late-successional habitat characteristics and 1,966 acres have had fuels reduction treatments completed to restore habitat through the reintroduction of fire and to protect existing late-successional habitat from stand-replacing fire. The *Big Flat Vegetation Management and Fuels Reduction* project is currently being implemented and will improve habitat conditions on 1084 acres and protect existing habitat through fuels reduction on 735 acres. The *Gordon Hill Vegetation Management and Fuels Reduction* project will improve habitat conditions on 1,515 acres and protect existing habitat through fuels reduction on 1,273 acres. Accelerating the development of late-successional characteristics, and protecting existing habitat, will move the area toward the historic range of variability of seral stages and reduce fragmentation of habitat, improving habitat conditions for threatened, Forest Service Sensitive, MIS, and NTM species, and other wildlife species.

Since the signing of the Forest Plan in 1995, 51.6 miles of road have been decommissioned or downgraded to ML 1 on the Smith River NRA. Alternative 4 of the *Smith River NRA* project will remove 135.93 miles of road/routes and reduce road density across the Smith River NRA. Short-term negative impacts could occur from the use of heavy equipment (noise disturbance) while decommissioning or upgrading roads. However, reducing road density across the district will reduce fragmentation of habitat, increase patch size, and reduce disturbance and direct mortality. The project when considered with the past, present and reasonably foreseeable future actions will have no negative cumulative impacts to wildlife. In the long term, the project will benefit threatened, Forest Service Sensitive, MIS, NTM, elk, and other wildlife species.

Alternative 5

Direct and Indirect Effects

Changes between the draft and final EIS for Alternative 5 include adding seasonal and year-round gates, changing barricades to year-round gates, replacing the 18N07 Griffin Creek Bridge, removing seasonal gates that were determined to be in low risk areas or were already closed by another gate elsewhere, downgrading two roads from ML 3 to ML 2, decommissioning additional ML 1 roads, decommissioning or downgrading to ML 1 two additional ML 2 roads, and restoring 6 additional UARs.

Changing barricades to gates, downgrading ML 3 to 2, or changing ML 1 roads to decommissioning will not change the level of use; therefore will not change the effects on listed and Forest Service Sensitive species. The current level of use of the roads to be downgraded is expected to continue. ML 1 roads are closed to traffic and are allowed revegetate; therefore, there will be no use on either ML 1 or decommissioned roads. Future use of ML 1 roads will require additional NEPA analysis before they can be opened. The Griffin Creek Bridge is the access point from US Highway 199, and construction will not increase the amount of noise disturbance in the area. The six UARs to be decommissioned occur in serpentine habitats that are not suitable for any threatened or Forest Service Sensitive species.

Of the two ML 2 roads that are proposed for downgrading to ML 1 and decommissioning, only one portion of one road (approximately 0.16 miles) occurs in currently suitable threatened, or Forest Service Sensitive species habitat; however both roads occur in capable threatened or Forest Service Sensitive species habitat (have the potential to become suitable habitat in the future). In the long-term, this alternative has the potential to restore an additional 1.03 miles in potential threatened or Forest Service Sensitive species habitat.

None of the changes made to Alternative 5 between the draft and final EIS change the level of impact or effects to threatened or Forest Service Sensitive species. There will be no additional impacts to habitat for MIS, NTM, or S&M species.

Alternative 5 of the *Smith River NRA Travel Management* project will remove 297.88 miles of road/routes and reduce road density across the Smith River NRA. Alternative 5 will reduce overall ML 1, 2 road and UAR miles on the Smith River NRA by 47 percent (Table 3-155). Road density will be reduced from Road density will be reduced across the district, varying from 0.15 miles per square mile to 1.05 miles per square mile depending on the 5th-field watershed (Table 3-156). No UARs will be added in late-successional habitat or within 0.25 miles of known threatened, proposed, or Forest Service Sensitive species nest or other sensitive sites. Approximately 174 (105.58 miles) NFTS roads/UARs will be removed (decommissioned or restored) from within known NSO territories.

Unauthorized routes are proposed to be added to the system within LSR/ MAMU Critical Habitat units (2 routes for a total of 0.24 miles) and NSO Critical Habitat (1 route for 1.74 miles). None of the roads to be added to the system occur in suitable habitat for the MAMU, NSO, or other late-successional habitat species. A total of 112 roads/roads/routes (60.13 miles) will be removed from LSR/MAMU Critical Habitat units and 97 roads/routes (52.1 miles) will be removed from NSO Critical Habitat units under this alternative.

Road Density

Alternative 5 reduces road density in all 5th-field watersheds (Table 3-156). None of the 5th-field watersheds exceed 2 miles per square mile under Alternative 5.

Depending on the species, moderate to high capability is maintained in all watersheds (less miles per square mile) for the fisher and marten under Alternative 5 (Forest Plan FEIS (1995) Appendix B, pp. B-53 and B-56).

No new road construction or reconstruction will occur under as part of this project. Therefore, no NSO or MAMU Critical Habitat will be removed through road construction and no suitable habitat will be removed for any threatened, Forest Service Sensitive, MIS, NTM, S&M, or other wildlife species. Culvert removal on roads/routes to be decommissioned or restored may require minor amounts of brush and smaller diameter trees (saplings up to 11-inch dbh) to be removed at culvert inlets and/or outlet (usually 0.1 acre or less); however, the removal will be negligible in any one area. Approximately 251 culverts would be removed across the district under Alternative 5; therefore, approximately a total of 25 acres of vegetation may be removed. This is an overestimate of the amount of vegetation to be removed in that not all culverts sites have been brushed in, the roads may occur in naturally open areas, or the amount of vegetation to be removed is less than one-tenth of an acre.

Suitable habitat for threatened or Forest Service Sensitive species may be degraded by removing understory vegetation for late-successional species such as the NSO, but impacts are negligible in any one area and the habitat will remain suitable post-project.

Minor vegetation removal at culvert sites may degrade suitable habitat for MIS, NTM and other wildlife species by removing habitat for early-seral stage species such as the winter wren; however, the removal will be negligible in any one area. Culvert removal activities could also affect Forest Service Sensitive and MIS such as the yellow-legged frog and southern torrent salamander from heavy equipment use in the channel during project implementation; however, channel restoration will benefit aquatic species in the long term.

Primary constituent elements of the 2012 NSO Critical Habitat units include forested stands that qualify as nesting/roosting, foraging, or dispersal habitat. One-tenth acre of brush and small diameter trees will be removed in any one area. Impacts to NSO Critical Habitat units will be negligible. Although multi-layered conditions contributing to nesting/roosting and foraging habitat may be slightly reduced by removing brush and understory trees less than 11-inch dbh, it will result in a reduction of fragmentation and long-term improvement of primary constituent elements in the critical habitat units. Northern spotted owl Critical Habitat units primary constituent elements may be modified but impacts will be negligible in any one area and current habitat function will be maintained in all treatment areas.

Primary constituent elements of MAMU Critical Habitat units include 1) individual trees with potential nesting platforms, and 2) forested areas within 0.5 miles of individual trees with potential nesting platforms, and with a canopy height of at least one-half the site-potential tree height. Saplings (up to 11-inch dbh) are not considered primary constituent elements. The project will not change the function of nesting habitat in MAMU Critical Habitat units.

Due to different habitat requirements, not all culvert sites occur in suitable or critical habitat for all threatened, Forest Service Sensitive, MIS, NTM, and other wildlife species, therefore 25 acres of habitat degraded under this alternative greatly overestimates the amount of habitat potentially affected for any one species.

High priority roads determined to have a high risk to aquatic resources will need to have the restoration work accomplished during the breeding season of the NSO, MAMU, and Forest Service Sensitive species such as the fisher, marten and northern goshawk. Work on these roads will include decommissioning and upgrading. Delaying implementation until after the breeding season would mean that the project would require multiple years of work on the same road, which greatly increases the cost of the work as well as increasing risk to aquatic resources. Therefore, no limited operating period will be imposed on activities proposed for these roads except for within 0.25 miles of a known NSO AC, occupied MAMU site, or active Forest Service Sensitive nest/den. Not all the high-risk roads or all segments of each road are within 0.25 of suitable habitat for these species. Several roads are within the US Highway199 corridor, and have high ambient noise levels. Others occur in unsuitable habitat. There are 76 high-risk roads to be removed or upgraded 70 of which occur, at least partially, in unsurveyed suitable nesting habitat for NSO, MAMU, and Forest Service Sensitive species. Of these, 52 will be decommissioned or downgraded to ML 1 (culverts removed and drainage issues corrected) and 24 will be upgraded (larger culverts installed and drainage issues corrected) under Alternative 5.

Conclusions

Alternative 5 of the Smith River travel management project was determined to have minimal habitat effects (maximum 25 acres across the district at culvert removal sites, one-tenth acre at any one area) with long-term benefits of reducing road density across the district.

Alternative 5 would result in a 47 percent reduction of ML 1, 2 roads and UARs across the Smith River NRA, which will benefit wildlife in the short-term through elimination of noise disturbance on closed roads/routes and in the long-term through the reduction of fragmentation and habitat restoration.

Endangered Species Act Determination

Implementation of Alternative 5 during the breeding season will cause noise disturbance for the NSO and MAMU. The project is likely to adversely affect the NSO and MAMU in the short term from noise disturbance during the breeding season but will have long-term beneficial effects through the reduction of road density. The project is not likely to adversely affect NSO Critical Habitat through negligible habitat removal at culvert sites, and is expected to improve habitat conditions in the long term through the reduction of road density. The project will have no effect on MAMU Critical Habitat.

Alternative 5 may impact individuals but will not cause a trend towards listing for any Forest Service Sensitive species.

Alternative 5 complies with the Forest Plan in regards to the analysis of effects to MIS, NTM, S&M, and other wildlife species.

Cumulative Effects

The list of past, present and reasonably foreseeable projects that were considered in the analysis of cumulative effects to wildlife species can be found in Appendix C. The project encompasses the entire Smith River NRA extended to include extended to include all NSO territories affected by project; therefore, the action area is 367,368 acres and defines the context of the analysis.

Regarding all the past impacts from land uses (mining, timber harvest, road constructions), all action alternatives will reduce the current effects from old failing roads, and will accelerate the recovery rate of disturbed areas and facilitate restoration by reducing road density across the action area. The beneficial cumulative effects include the reduction of habitat fragmentation for threatened, Forest Service Sensitive, MIS, NTM, and other wildlife species including reducing road-related disturbance and mortality for wildlife, increasing POC protection (important riparian canopy species, especially in serpentine areas), and reducing the extent of hydrologic connectivity and road-related sedimentation to aquatic species habitat. All action alternatives are beneficial to sensitive resources when compared the cumulative effects from past actions.

The trend for wildlife habitats on the Smith River NRA is towards recovery. Since the 1990 Smith River NRA Act, timber harvest on the Smith River NRA has been limited and geared towards habitat restoration (thinning in younger stands). Fuel treatments have been developed to help restore natural fire regimes and to protect existing habitats. Since the Smith River NRA Act in 1990, 884 acres have been thinned using silvicultural prescriptions designed to accelerate the development of late-successional habitat characteristics and 1,966 acres have had fuels reduction treatments completed to restore habitat through the reintroduction of fire and to protect existing late-successional habitat from stand-replacing fire. The *Big Flat Vegetation Management and Fuels Reduction* project is currently being implemented and will improve habitat conditions on 1084 acres and protect existing habitat through fuels reduction on 735 acres. The *Gordon Hill Vegetation Management and Fuels Reduction* project will improve habitat conditions on 1,515 acres and protect existing habitat through fuels reduction on 1,273 acres. Accelerating the development of late-successional characteristics, and protecting existing habitat, will move the area toward the historic range of variability of seral stages and reduce fragmentation of habitat, improving habitat conditions for threatened, Forest Service Sensitive, MIS, NTM, and other wildlife species.

Since the signing of the Forest Plan in 1995, 51.6 miles of road have been decommissioned or downgraded to ML 1 on the Smith River NRA. Alternative 5 of the *Smith River NRA Travel Management* project will remove 297.88 miles of road/routes and reduce road density across the Smith River NRA. Short-term negative impacts could occur from the use of heavy equipment (noise disturbance) while decommissioning or upgrading roads. However, reducing road density across the district will reduce fragmentation of habitat, increase patch size, and reduce disturbance and direct mortality. The project, when considered with the past, present and reasonably foreseeable future actions will have no negative cumulative impacts on wildlife. In the long term, the project will benefit threatened, Forest Service Sensitive, MIS, NTM, elk, and other wildlife species.

Alternative 6

Direct and Indirect Effects

Changes between the draft and final EIS for Alternative 6 include adding seasonal and year-round gates, changing barricades to year-round gates, replacing the 18N07 Griffin Creek Bridge, removing seasonal gates that were determined to be in low risk areas or were already closed by another gate elsewhere, downgrading two roads from ML 3 to ML 2, decommissioning additional ML 1 roads, changing two roads from restore/decommissioning to ML 1, and designating two UARs as motorized trails.

Changing barricades to gates, downgrading ML 3 to 2, or changing ML 1 roads to decommissioning or restore/decommissioned roads to ML 1 will not change the level of use; therefore will not change the effects on listed and Forest Service Sensitive species. The current level of use of the roads to be downgraded is expected to continue. ML 1 roads are closed to traffic and are allowed revegetate; therefore, there will be no use on either ML 1 or decommissioned roads. Future use of ML 1 roads will require additional NEPA analysis before they can be opened for use. The Griffin Creek Bridge is the access point from US Highway 199, and construction will not increase the amount of noise disturbance in the area. The two UARs to be added as motorized trails occur in serpentine habitats that are not suitable for any threatened or Forest Service Sensitive species.

None of the changes made to Alternative 6 between the draft and final EIS change the level of impact or effects to threatened or Forest Service Sensitive species. There will be no additional impacts to habitat for MIS, NTM, or S&M species.

Alternative 6 of the *Smith River NRA Travel Management* project will remove 167.78 miles of road/routes and reduce road density across the Smith River NRA. Alternative 6 will reduce overall ML 1, 2 road and UAR miles on the Smith River NRA by 40 percent (Table 3-155). Road density will be reduced from Road density will be reduced across the district, varying from 0.24 miles per square mile to 1.25 miles per square mile depending on the 5th-field watershed (Table 3-156). Three routes (0.16 miles total) will be added within late-successional habitat. These sites are dispersed camping sites that have been in use for many years. No UARs will be added within 0.25 miles of known threatened or Forest Service Sensitive species nest or other sensitive sites. Approximately 157 (80.39 miles) NFTS roads/UARs will be removed (decommissioned or restored) from within known NSO territories.

Unauthorized routes are proposed to be added to the system within LSR/MAMU Critical Habitat units (8 routes for a total of 1.93 miles) and NSO Critical Habitat (5 routes for 1.92 miles). None of the roads to be added to the system occur in suitable habitat for the MAMU, NSO, or habitat for other late-successional habitat species. A total of 112 roads/roads/routes (60.13 miles) will be removed from LSR/MAMU Critical Habitat units and 97 roads/routes (52.1 miles) will be removed from NSO Critical Habitat units under this alternative.

Road Density

Alternative 6 reduces road density in all 5th-field watersheds (Table 3-156). None of the 5th-field watersheds exceed 3 miles per square mile. All alternatives are less than 2 miles per square mile (Forest Plan FEIS (1995) Appendix B, pp. B-53 and B-56).

Depending on the species, moderate to high capability is maintained in all watersheds (less 2 miles per square mile) for the fisher and marten under Alternative 6. No new road construction or reconstruction will occur under as part of this project and only minor expansion of existing open areas (brush removal) will occur under Alternative 6 to allow parking along 17N49, which does not occur in potential habitat for any wildlife species of concern. Therefore, no NSO or MAMU Critical Habitat will be removed through road construction and no suitable habitat will be removed for any threatened, Forest Service Sensitive, MIS, NTM, S&M, or other wildlife species. Culvert removal on roads/routes to be decommissioned or restored may require minor amounts of brush and smaller diameter trees (saplings up to 11-inch dbh) to be removed at culvert inlets and/or outlet (usually 0.1 acre or less); however, the removal will be negligible in any one area. Approximately 170 culverts would be removed across the district under Alternative 6; therefore, approximately a total of 17 acres of vegetation may be removed. This is an overestimate of the amount of vegetation to be removed in that not all culverts sites have been brushed in, the roads may occur in naturally open areas, or the amount of vegetation to be removed is less than one-tenth of an acre.

Suitable habitat for threatened or Forest Service Sensitive species may be degraded by removing understory vegetation for late-successional species such as the NSO, but impacts are negligible in any one area (one-tenth acre or less) and the habitat will remain suitable post-project.

Minor vegetation removal at culvert sites may degrade suitable habitat for MIS, NTM, and other wildlife species by removing habitat for early-seral stage species such as the winter wren; however, the removal will be negligible in any one area. Culvert removal activities could also affect Forest Service Sensitive species and MIS such as the yellow-legged frog and southern torrent salamander from heavy equipment use in the channel during project implementation; however, channel restoration will benefit aquatic species in the long term.

Primary constituent elements of the 2012 NSO Critical Habitat units include forested stands that qualify as nesting/roosting, foraging, or dispersal habitat. One-tenth acre of brush and small diameter trees will be removed in any one area. Impacts to NSO Critical Habitat units will be negligible. Although multi-layered conditions contributing to nesting/roosting and foraging habitat may be slightly reduced by removing brush and understory trees less than 11-inch dbh, it will result in a reduction of fragmentation and long-term improvement of primary constituent elements in the critical habitat units. Northern spotted owl Critical Habitat primary constituent elements may be modified but current but the impacts will be negligible and habitat function will be maintained in all treatment areas.

Primary constituent elements of MAMU Critical Habitat units include: 1) individual trees with potential nesting platforms, and 2) forested areas within 0.5 miles of individual trees with potential nesting platforms, and with a canopy height of at least one-half the site-potential tree height. Saplings (up to 11-inch dbh) are not considered primary constituent elements. The project will not change the function of nesting habitat in MAMU Critical Habitat.

Due to different habitat requirements, not all culvert sites occur in suitable or critical habitat for all threatened, Forest Service Sensitive, MIS, NTM, and other wildlife species; therefore, 17 acres of habitat degraded under this alternative greatly overestimates the amount of habitat potentially affected for any one species.

High priority roads determined to have a high risk to aquatic resources will need to have the restoration work accomplished during the breeding season of the NSO, MAMU, and Forest Service Sensitive species such as the fisher, marten, and northern goshawk. Work on these roads will include decommissioning and upgrading. Delaying implementation until after the breeding season would mean that the project would require multiple years of work on the same road, which greatly increases the cost of the work as well as increasing risk to aquatic resources. Therefore, no limited operating period will be imposed on activities proposed for these roads except for within 0.25 miles of a known NSO AC, occupied MAMU site, or active Forest Service Sensitive nest/den. Not all the high-risk roads or all segments of each road are within 0.25 of suitable habitat for these species. Several roads are within the US Highway199 corridor, and have high ambient noise levels. Others occur in unsuitable habitat. There are 76 high-risk roads to be removed or upgraded 70 of which occur, at least partially, in unsurveyed suitable nesting habitat for NSO, MAMU, and Forest Service Sensitive species. Of these, 46 will be decommissioned or downgraded to ML 1 (culverts removed and drainage issues corrected) and 30 will be upgraded (larger culverts installed and drainage issues corrected) under Alternative 6.

Conclusions

Alternative 6 of the *Smith River NRA Travel Management* project was determined to have minimal habitat effects (maximum 17 acres across the district at culvert removal sites) with long-term benefits of reducing road density across the district.

Alternative 6 would result in a 40 percent reduction of ML 1, 2 roads and UARs across the Smith River NRA, which will benefit wildlife in the short-term through elimination of noise disturbance on closed roads/routes and in the long-term through the reduction of fragmentation and habitat restoration.

Endangered Species Act Determination

Implementation of Alternative 6 during the breeding season will cause noise disturbance for the NSO and MAMU. The project is likely to adversely affect the NSO and MAMU in the short term from noise disturbance during the breeding season but will have long-term beneficial effects through the reduction of road density. The project is not likely to adversely affect NSO Critical Habitat through negligible habitat removal at culvert sites, and is expected to improve habitat conditions in the long term through the reduction of road density. The project will have no effect on MAMU Critical Habitat.

Alternative 6 may impact individuals but will not cause a trend towards listing for any Forest Service Sensitive species.

Alternative 6 complies with the Forest Plan in regards to the analysis of effects to MIS, NTM, S&M, and other wildlife species.

Cumulative Effects

The list of past, present and reasonably foreseeable projects that were considered in the analysis of cumulative effects to wildlife species can be found in Appendix C. The project encompasses the entire Smith River NRA and Gasquet District, extended to include extended to include all NSO territories affected by project; therefore, the action area is 367,368 acres and defines the context of the analysis.

Regarding all the past impacts from land uses (mining, timber harvest, road constructions), all action alternatives will reduce the current effects from old failing roads, and will accelerate the recovery rate of disturbed areas and facilitate restoration by reducing road density across the action area. The beneficial cumulative effects include the reduction of habitat fragmentation for threatened, Forest Service Sensitive, MIS, NTM, and other wildlife species including reducing road-related disturbance and mortality for wildlife, increasing POC protection (important riparian canopy species especially in serpentine areas), and reducing the extent of hydrologic connectivity and road-related sedimentation to aquatic species habitat. All action alternatives are beneficial to sensitive resources when compared the cumulative effects from past actions.

The trend for wildlife habitats on the Smith River NRA is towards recovery. Since the 1990 Smith River NRA Act, timber harvest on the Smith River NRA has been limited and geared towards habitat restoration (thinning in younger stands). Fuel treatments have been developed to help restore natural fire regimes and to protect existing habitats. Since the Smith River NRA Act in 1990, 884 acres have been thinned using silvicultural prescriptions designed to accelerate the development of late-successional habitat characteristics and 1,966 acres have had fuels reduction treatments completed to restore habitat through the reintroduction of fire and to protect existing late-successional habitat from stand-replacing fire. The *Big Flat Vegetation Management and Fuels Reduction* project is currently being implemented and will improve habitat conditions on 1084 acres and protect existing habitat through fuels reduction on 735 acres. The *Gordon Hill Vegetation Management and Fuels Reduction* project will improve habitat conditions on 1,515 acres and protect existing habitat through fuels reduction on 1,273 acres. Accelerating the development of late-successional characteristics, and protecting existing habitat, will move the area toward the historic range of variability of seral stages and reduce fragmentation of habitat, improving habitat conditions for threatened, Forest Service Sensitive, MIS, NTM, and other wildlife species.

Since the signing of the Forest Plan in 1995, 51.6 miles of road have been decommissioned or downgraded to ML 1 on the Smith River NRA. Alternative 6 of the *Smith River NRA Travel Management* project will remove 167.78 miles of road/routes and reduce road density across the Smith River NRA. Short-term negative impacts could occur from the use of heavy equipment (noise disturbance) while decommissioning or upgrading roads. However, reducing road density across the district will reduce fragmentation of habitat, increase patch size, and reduce disturbance and direct mortality. The project when considered with the past, present and reasonably foreseeable future actions will have no negative cumulative impacts on wildlife. In the long term, the project will benefit threatened, Forest Service Sensitive, MIS, NTM, elk, and other wildlife species.

Summary of Effects to Wildlife

As stated above, all action alternatives will reduce road densities of ML 1, 2 roads and UARs across the Smith River NRA, although the beneficial effects vary between alternatives. Table 3-157 rates each alternative relative to the indicators used to evaluate the impacts of the project to wildlife.

Table 3-157. Ranking of alternatives relative to wildlife indicator and overall benefit to wildlife.

Indicator – Wildlife	Rankings of Alternatives for Each Indicator[60]			
	Alt 1	Alt 4	Alt 5	Alt 6
Miles/number of routes of UAR added in late successional habitat.	5	1	5	
Miles of UAR added in within 0.25 mile of known threatened, or Forest Service Sensitive species nest/dens or sensitive sites.	1	5	5	5
Miles/number of routes of UAR added in LSR/MAMU Critical Habitat.	5	3	4	1
Miles/number of routes of UAR added in NSO Critical Habitat.	5	2	4	3
Miles/number of routes system roads and UAR decommissioned/restored in LSR/MAMU Critical Habitat.	1	2	5	5
Miles/number of system roads and UAR decommissioned/restored in NSO Critical Habitat.	1	2	5	5
Miles/number of system roads and UAR decommissioned/restored in NSO territories.	1	4	5	2
Percent restored/decommissioned.	1	2	5	4
Average rank by alternative for wildlife relative to the indicators.	2.5	2.6	4.6	3.75
Overall ranking: most beneficial for wildlife.	1	2	4	3

Reducing road density across the district will reduce fragmentation of habitat as the decommissioned roads revegetate, increase patch size, reduce sedimentation in stream channels, and reduce disturbance and direct mortality. In addition, cross-country travel is prohibited under the Smith River NRA Act of 1990. An overall reduction of road densities across the Smith River NRA will benefit wildlife in the short-term through elimination of noise disturbance on closed roads/routes and in the long-term through the reduction of fragmentation and habitat restoration. The project will benefit wildlife.

Short-term Uses and Long-term Productivity

The NEPA requires consideration of “the relationship between short-term uses of man’s environment and the maintenance and enhancement of long-term productivity” (40 CFR 1502.16). As declared by the Congress, this includes using all practicable means and measures, including financial and technical assistance, in a manner calculated to foster and promote the general welfare, to create and maintain conditions under which man and nature can exist in productive harmony, and fulfill the social, economic, and other requirements of present and future generations of Americans (NEPA §101).

Alternatives 5, 6, and 4, from most to least, have the potential to improve long-term productivity by reducing the number of miles of UARs on the landscape. Routes that are not designated for public motor vehicle use will have the potential to revert to vegetated conditions.

Unavoidable Adverse Effects

Implementation of any action alternative could cause some adverse environmental effects that cannot be effectively mitigated or avoided. Unavoidable adverse effects often result from managing the land for one

[60] A score of 5 indicates the alternative is the best for wildlife relative to the indicator and a score of 1 indicates the alternative is the worst for wildlife relative to the indicator.

resource at the expense of the use or condition of other resources. Some adverse effects are short term and necessary to achieve long-term beneficial effects. Many adverse effects can be reduced, mitigated, or avoided by limiting the extent or duration of effects. The interdisciplinary procedure used to identify specific roads and UARs was designed to eliminate or lessen the significant adverse consequences to resource protection standards of the Forest Plan. The application of mitigation measures was intended to further limit the extent, severity, and duration of potential effects. Such measures are discussed throughout this chapter.

Implementation of any of the alternatives would result in some unavoidable adverse environmental effects. Although formation of the action alternatives included avoidance of some potential adverse effects, other adverse effects could occur that cannot be completely mitigated. The environmental consequences section for each resource area discusses these effects, if applicable.

Irreversible and Irretrievable Commitments of Resources

Irreversible commitments of resources are those that cannot be regained, such as the extinction of a species or the removal of mined ore. Irretrievable commitments are those that are lost for a period of time such as the temporary loss of timber productivity in forested areas that are kept clear for use as a power line rights-of-way or road. There are no irreversible commitments of resources expected as a result of this project; however, the roads and motorized trails designated on the NFTS are irretrievable commitments of resources for which other uses such as timber productivity are lost for a period of time.

Legal and Regulatory Compliance

The NEPA at 40 CFR 1502.25(a) directs “to the fullest extent possible, agencies shall prepare draft environmental impact statements concurrently with and integrated with …other environmental review laws and executive orders.” The action alternatives comply with following:

Principle Environmental Laws

The following laws contain requirements for protection of the environment that apply to the proposed action and alternatives:

- Endangered Species Act
- Clean Water Act
- Clean Air Act
- National Historic Preservation Act
- Coastal Zone Management Act
- National Forest Management Act
    - 10 Findings Pertaining to Timber Harvest
    - Soil Productivity
    - Management Indicator Species

  - Other standards and guidelines, especially those dealing with water quality

- Smith River National Recreation Act.

Executive Orders

The following executive orders provide direction to federal agencies that apply to the proposed action and alternatives:

- Indian Sacred Sites, Executive Order 13007 of May 24, 1996
- Invasive Species, Executive Order 13112 of February 3, 1999
- Recreational Fisheries, Executive Order 12962 of June 6, 1995
- Migratory Birds, Executive Order 13186 of January 10, 2001
- Floodplain Management, Executive Order 11988 of May 24, 1977
- Protection of Wetlands, Executive Order 11990 of May 24, 1977
- Environmental Justice, Executive Order 12898 of February 11, 1994
- Use of Off-Road Vehicles, Executive Order 11644, February 8, 1972.

Special Area Designations

The selected alternative will need to comply with laws, regulations and policies that pertain to the following special areas:

- Research Natural Areas
- Inventoried Roadless Areas
- Smith River National Recreation Area
- Special Interest Areas
- Wilderness Areas
- Wild and Scenic Rivers
- Municipal Watersheds (FSM 2540).

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Chapter 4. Consultation and Coordination

Preparers and Contributors

Forest Service Interdisciplinary Team

This section identifies the primary individuals (Table 4-1) who were involved in the development of the FEIS for the *Smith River NRA Restoration and Motorized Travel Management* project.

Table 4-1. Interdisciplinary team (IDT) members.

Interdisciplinary Team Member	Role or Resource Area	Experience/Education
Merv L. George	Responsible Official	Forest Supervisor
David Palmer	Line Officer	District Ranger
Tyrone Kelley	Line Officer	Forest Supervisor – 8 years, B.S. Mechanical Engineering
Mary Kay Vandiver	Line Officer	District Ranger – 12 years, B.S. Forestry and Business Administration
Christy Prescott	IDT Leader, Writer/Editor Inventoried Roadless Areas (FEIS)	Environmental Coordinator – 7 years, B.S. Environmental Science, M.A. Social Science
Brenda Devlin	Wildlife	Wildlife Biologist – 24 years, M.S. Wildlife
Mike McCain	Fisheries	Fisheries Biologist – 23 years, B.S. Fisheries and M.S. Natural Resources
Corrine Black	Hydrology	Hydrologist – 20 years, B.S. Forestry
Sheila Balent	Fire and Fuels	Fuels Specialist – 7 years, B.S. Fire Science (in progress)
Julie Ranieri	Public Affairs	Public Affairs Officer – 14 years, B.S. Forestry
John McRae	Botany and Noxious Weeds	Botanist – 18 years, B.S. Horticulture
Julie Cassidy	Archeology	Archeologist – 30 years, M.A. Anthropology
Brandy Clark	Archeology	Archaeological Technician – 2 years, B.A. Anthropology, B.A. Art History
Jennifer Dyer	Heritage Program Manager	Archaeologist 17 years, PhD Anthropology
Jennifer Peterson	GIS Support	GIS Specialist – 5 years, M.S. GIS
Julia Everta	Recreation	Lands and Special Uses – 13 years, M.A. Biology
Lynn Wright	Visuals	Partnership Coordinator – 2 years, B.A. Political Science
Terrah Owens	Wildlife	Wildlife Biologist – 2 years, B.S. Zoology
Mike Turek	Economic	Tribal Relations – 20 years, B.A. Human Ecology
Scott Haggerty	Soils	Soils Scientist – 30 years, B.S. Forestry
Fred Levitan	Geology	Geologist – 10 years, B.S. and M.S. (in progress) Geology
Jeff Jones	Port-Orford-cedar	Ecologist/Silviculturist – 23 years, M.S. Forestry/Natural Resources
Kary Schlick	Inventoried Roadless Areas (DEIS)	Wildlife Biologist – 15 years, B.S. Zoology and Biology
Victor Dumlao	Transportation	Transportation Planner – 4 years, B.S. Civil Engineering, P.E.

Federal, State, and Local Agencies

The Forest Service also consulted federal, state, and local agencies, and tribes during the development of this environmental impact statement. Countless individuals provided additional information.

- Del Norte County Board of Supervisors
- Del Norte County Sheriff's Office
- National Marine Fisheries Service, California Coastal Branch, Arcata Office
- US Fish and Wildlife Service, Arcata Office
- State Historic Preservation Officer
- Environmental Protection Agency
- North Coast Regional Water Quality Control Board
- Tribes:
  - Elk Valley Rancheria, 2332 Howland Hill Road, Crescent City, CA 95531
  - Yurok Tribe, 190 Klamath Boulevard, PO Box 1027, Klamath, CA 95548
  - Resighini Rancheria, PO Box 529, Klamath, CA 95548
  - Smith River Rancheria of the Tolowa Dee-ni′ Indians, 149 Rowdy Creek Road, Smith River, CA 95567
  - The Karuk Tribe, 64236 Second Avenue, PO Box 1016, Happy Camp, CA 96039

Distribution of the Environmental Impact Statement

This environmental impact statement has been distributed to individuals who specifically requested a copy of the document. In addition, copies have been sent to the following Federal agencies, federally recognized tribes, State and local governments, and organizations:

National Marine Fisheries Service

US Fish and Wildlife Service

Environmental Protection Agency Region 9

Klamath National Forest

Rogue River Siskiyou National Forest

Elk Valley Rancheria

Yurok Tribe

Resighini Rancheria

Smith River Rancheria of the Tolowa Dee-ni' Indians

The Karuk Tribe

The State Historic Preservation Officer

North Coast Regional Water Quality Control Board

Del Norte County Board of Supervisors

Del Norte County Sheriff's Office

Del Norte County Planning Division

Blue Ribbon Coalition

Agnew Company

American Towing

Environmental Protection Information Center

Far West Motorcycle Club

Friends of Del Norte

Friends of the Kalmiopsis

Green Diamond Resource Company

HW3 LLC

Klamath Forest Alliance

JR Wood Trucking Inc.

Northcoast Cliff Hangers

Northwest Trail Riders

Northcoast Environmental Center

OHMVR Commission

Siskiyou Land Conservancy

Smith River Advisory Council

Siskiyou Project

Smith River Alliance

Wildlands CPR

Klamath Siskiyou Wildlands Center

Redwood National Park

Backcountry Horsemen

South Coast Lumber Company

Pacific Power Company

Oregon Wild

Center for Sierra Nevada Conservation

Congressman Jared Huffman

California Wilderness Coalition

Kayser Investment Group LLC

California Native Plant Society

Environmental Policies and Procedures Committee

Private landowners with property that may be affected by the project:

Donald and Barby Edwards

Janet Didonato

Jose Luis and Cathy Caballero

Sara May Twigg

Dan and Sharol Leavitt

Micheal Mitchell

Glossary

Terminology

The Forest Service uses the term *NFS road* and *NFS trail* (also referred to as NFS routes when combined) to refer to any road or trail that is listed on the forest transportation atlas other than a road or trail which has been authorized by a legally documented right-of-way held by a State, county, or other local public road authority. The NFS routes range from trails to arterial and collector roads, which may be paved or surfaced, to local roads that may be either improved or unimproved. The lower-level, unimproved roads are not actively maintained, but are primarily kept open by timber sale road reconstruction and vehicle use.

In addition to NFS routes on the transportation system, a number of other types of routes currently exist on the Forest. Some originated as temporary logging roads, skid trails, or firelines, which were never rehabilitated, and, over time, have remained open to use by the public, even though they are not maintained. Forest users created other routes by driving cross-country through the forest. These routes are not part of the forest transportation atlas, and, are therefore, referred to as *unauthorized routes*.

Definitions

Affecting. Will or may have an effect on.

All-terrain vehicle (ATV): A type of off-highway vehicle that travels on three or more low-pressure tires; has handlebar steering; is less than or equal to 50 inches in width; and has a seat designed to be straddled by the operator.

Area: A discrete, specifically delineated space that is smaller, and in most cases much smaller, than a Ranger District (36 CFR 212.1).

Arterial road: An NFS road that provides service to large land areas and usually connects with other arterial roads or public highways.

Collector road: An NFS road that services smaller areas than an arterial road and that usually connects arterial roads to local roads or terminal facilities.

Cumulative impact: The impact on the environment, which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (federal or non-federal) or person, undertakes such other actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time. §1508.7.

Designated road, trail, or area: A NFS road, NFS trail, or an area on NFS lands that is designated for motor vehicle use pursuant to 36 CFR part 212.51 on a motor vehicle use map (36 CFR 212.1).

Effects: Effects and impacts as used in these regulations are synonymous. Effects include ecological (such as the effects on natural resources and on the components, structures, and functioning of affected ecosystems), aesthetic, historic, cultural, economic, social, or health, whether direct, indirect, or cumulative. Effects may also include those resulting from actions that may have both beneficial and detrimental effects, even if on balance the agency believes that the effect will be beneficial. §1508.8. Effects include:

- **Direct effects,** which are caused by the action and occur at the same time and place.
- **Indirect effects**, which are caused by the action and are later in time or farther removed in distance, but are still reasonably foreseeable. Indirect effects may include growth-inducing effects and other effects related to induced changes in the pattern of land use, population density or growth rate, and related effects on air and water and other natural systems, including ecosystems.

Forest road or trail: A road or trail wholly or partially within or adjacent to and serving the NFS that the Forest Service determines is necessary for the protection, administration, and utilization of the NFS and the use and development of its resources (36 CFR 212.1).

Forest transportation atlas: A display of the system of roads, trails, and airfields of an administrative unit (36 CFR 212.1).

Forest transportation facility: A forest road or trail or an airfield that is displayed in a forest transportation atlas, including bridges, culverts, parking lots, marine access facilities, safety devices, and other improvements appurtenant to the forest transportation system (36 CFR 212.1).

Forest transportation system: The system of NFS roads, trails, and airfields on NFS lands (36 CFR 212.1).

Green-sticker Vehicle: A motor vehicle built since 2003, which complies with the 1998 California Air Resources Board off-highway vehicle exhaust emission standards and registered pursuant to California Vehicle Code Book Division 16.5, §38160, in addition to those built prior to 2003 and registered pursuant to California Vehicle Code Book Division 16.5, §38160. Currently, the registration identification for these vehicles in the State of California comes in the form of a green sticker. These vehicles may include motorcycles, motor driven cycles, sand buggies, dune buggies, all-terrain vehicles (ATV), or any motor vehicle commonly referred to as a jeep or four-wheel drive (4WD).

Highway-licensed vehicle: Any motor vehicle that is licensed or certified under state law for general operation on all public roads within the state. Operators of highway legal vehicles are subject to state traffic law, including requirements for operator licensing.

Human environment: Includes the natural and physical environment and the relationship of people with that environment. (See the definition of *effects* (§1508.8).) This means that economic or social effects are not intended by themselves to require preparation of an environmental impact statement. When an environmental impact statement is prepared and economic or social and natural or physical environmental effects are interrelated, then the environmental impact statement will discuss all of these effects on the human environment. §1508.14.

Local road: A NFS road that connects a terminal facility with collector roads, arterial roads, or public highways and that usually serves a single purpose involving intermittent use.

Maintenance level (ML): Defined in FSH 7709.58, 10, 12.3 as the level of service provided by, and maintenance required for, a specific road. Maintenance levels must be consistent with road management objectives, and maintenance criteria. Roads may be maintained at one level and planned to be maintained at a different level at some future date. The maintenance level is the maintenance level currently assigned to a road considering today's needs, road condition, budget constraints, and environmental concerns; in other words, it defines the standard to which the road is currently being maintained. The objective maintenance level is the maintenance level to be assigned at a future date considering future road management objectives, traffic needs, budget constraints, and environmental concerns.

Maintenance Level 1 road: Defined in FSH 7709.58, 10, 12.3 as intermittent service roads during the time they are closed to vehicular traffic. The closure period must exceed 1 year. Basic custodial maintenance is performed to keep damage to adjacent resources to an acceptable level and to perpetuate the road to facilitate future management activities. Emphasis is normally given to maintaining drainage facilities and runoff patterns. Planned road deterioration may occur at this level. Appropriate traffic management strategies are *prohibit* and *eliminate*. Roads receiving Level 1 maintenance may be of any type, class, or construction standard, and may be managed at any other maintenance level during the time they are open for traffic. However, while being maintained at Level 1, they are closed to vehicular traffic, but may be open and suitable for nonmotorized uses. These roads have the following attributes: 1) vehicular traffic is eliminated, including administrative traffic; 2) physically blocked or entrance is disguised; 3) not subject to the requirements of the Highway Safety Act; 4) maintenance is done only to minimize resource impacts; and 5) no maintenance other than a condition survey may be required so as long as no potential exists for resource damage. See *Road Storage*.

Maintenance Level 2 road: Defined in FSH 7709.58, 10, 12.3 as roads open for use by high-clearance vehicles. Passenger car traffic is not a consideration. Traffic is normally minor, usually consisting of one or a combination of administrative, permitted, dispersed recreation, or other specialized uses. Log haul may occur at this level. Appropriate traffic management strategies 1) discourage or prohibit passenger cars or 2) accept or discourage high-clearance vehicles. These roads have the following attributes: 1) low traffic volume and low speed; 2) typically local roads; 3) typically connect collectors and other local roads; 4) dips are the preferred drainage treatment; 5) not subject to the requirements of the Highway Safety Act; 6) surface smoothness is not a consideration; and 7) not suitable for passenger cars.

Maintenance Level 3 road: Defined in FSH 7709.58, 10, 12.3 as roads open and maintained for travel by prudent drivers in a standard passenger car. User comfort and convenience are low priorities. Roads in this maintenance level are typically low speed, single lane with turnouts, and spot surfacing. Some roads may be fully surfaced with either native or processed material. Appropriate traffic management strategies are either *encourage* or *accept*. *Discourage* or *prohibit* strategies may be employed for certain classes of vehicles or users. These roads have the following attributes: 1) subject to the requirements of the Highway Safety Act and Manual of Uniform Traffic Control Devices (MUTCD); 2) roads have low- to moderate-traffic volume; 3) typically connect arterial and collector roads; 4) a combination of dips and culverts provide drainage; 5) may include some dispersed recreation roads; and 6) potholing or washboarding may occur. ML 3 roads are not included in the Proposed Action with the exception of 0.04 miles of UAR added to the NFTS road network.

Maintenance Level 4 road: Defined in FSH 7709.58, 10, 12.3 as roads that provide a moderate degree of user comfort and convenience at moderate travel speeds. Most roads are double lane and aggregate surfaced. However, some roads may be single lane. Some roads may be paved and/or dust abated. The most appropriate traffic management strategy is *encourage*. However, the *prohibit* strategy may apply to specific classes of vehicles or users at certain times. These roads have the following attributes: 1) subject to requirements of the Highway Safety Act and MUTCD; 2) roads have moderate traffic volume and speeds; 3) may connect to county roads; 4) culverts provide drainage; 5) usually a collector; and 6) may include some developed recreation roads. ML 4 roads are not included in the Proposed Action.

Maintenance Level 5 road: Defined in FSH 7709.58, 10, 12.3 as roads that provide a high degree of user comfort and convenience. These roads are normally double-lane, paved facilities. Some may be aggregate surfaced and dust abated. The appropriate traffic management strategy is *encourage*. These roads have the following attributes: 1) subject to the requirements of the Highway Safety Act and MUTCD; 2) highest traffic volume and speeds; 3) typically connect State and county roads; 4) culverts provide drainage; 5) usually arterial and collector; 6) may include some developed recreation roads; and 7) usually paved or chip-sealed. ML 5 roads are not included in the Proposed Action.

Mitigation: Includes (§1508.20):

- Avoiding the impact altogether by not taking a certain action or parts of an action.
- Minimizing impacts by limiting the degree or magnitude of the action and its implementation.
- Rectifying the impact by repairing, rehabilitating, or restoring the affected environment.
- Reducing or eliminating the impact over time by preservation and maintenance operations during the life of the action.
- Compensating for the impact by replacing or providing substitute resources or environments.

Motor vehicle: Any vehicle which is self-propelled, other than: 1) A vehicle operated on rails; and 2) Any wheelchair or mobility device that is designed solely for use by a mobility-impaired person for locomotion, and that is suitable for use in an indoor pedestrian area (36 CFR 212.1).

Motor vehicle use map (MVUM): A map reflecting designated roads, trails, and areas on an administrative unit or a ranger district of the NFS (36 CFR 212.1).

Motorized trail: A travel way usually, but not always, more than 50 inches in width usually, but not always, available for use by all-terrain vehicles (ATVs) and/or motorcycles. These travelways may also be made available to high-clearance four-wheel drive vehicles, and may be used by bicycles, horses, and hikers.

National Forest Transportation System: The system of forest roads and trails other than a road, which has been authorized by a legally documented right-of-way by a state, county, or local public road authority (36 CFR 212.1).

National Forest System road: A forest road other than a road, which has been authorized by a legally documented right-of-way by a state, county, or local public road authority (36 CFR 212.1).

National Forest System trail: A forest trail other than a trail, which has been authorized by a legally documented right-of-way held by a state, county, or local public road authority (36 CFR 212.1).

Non-highway legal vehicle: Any motor vehicle that is not licensed or certified under state law for general operation on all public roads within the state. Operators of non-highway legal vehicles are subject to State requirements, if any, for licensing and operation of the vehicle in questions.

Off-highway vehicle (OHV): Any motor vehicle designed for or capable of cross-country travel on or immediately over land, water, sand, snow, ice, marsh, swampland, or other natural terrain (36 CFR 212.1).

Private road: A road under private ownership authorized by an easement granted to a private party or a road that provides access pursuant to a reserved or outstanding right.

Public road: The road under the jurisdiction of and maintained by a public road authority and open to public travel (23 USC 101 (a)).

Qualified engineer: An engineer who by experience, certification, education, or license is technically trained and experienced to perform the engineering tasks specified and is designated by the Director of Engineering, Regional Office.

Red-sticker vehicle: Vehicles built since 2003 and registered pursuant to California Vehicle Code Book Division 16.5, §38160, which are not in compliance with the 1998 California Air Resources Board off-highway vehicle exhaust emission standards are issued a red sticker. Use of these vehicles may be restricted to specific days of the year and to specific areas in regions throughout the state.

Road: A motor vehicle route over 50 inches wide, unless identified and managed as a trail (36 CFR 212.1).

Road construction or reconstruction: Supervising, inspecting, actual building, and incurrence of all costs incidental to the construction or reconstruction of a road (36 CFR 212.1).

Road decommissioning: Activities that result in restoration of unneeded roads to a more natural state (FSM 7734).

Road maintenance: Ongoing upkeep of a road necessary to maintain or restore the road in accordance with its road management objectives (FSM 7714). On the Six Rivers National Forest – the *Road Maintenance Categorical Exclusion*.

Road Storage: In this FEIS, this term is used to describe the action of placing a road into ML 1 status. Roads that are closed and made hydrologically maintenance free, typically involves removing culverts and implementing road drainage improvements (similar to those *stormproofing* treatments).

Road Subject to the Highway Safety Act: An NFS road that is open to public use in a standard passenger car, including a road with access restricted on a seasonal basis and a road closed during extreme weather conditions or for emergencies, but which is otherwise open to public travel.

Route: A linear feature where vehicles have been traveling. Can refer to a NFTS road or trail. See *Unauthorized Route (UAR)*.

Scope: Scope consists of the range of actions, alternatives, and impacts to be considered in an environmental impact statement (§1508.25). The scope of an individual statement may depend on its relationships to other statements (§§1502.20 and 1508.28). To determine the scope of environmental impact statements, agencies shall consider three types of actions, three types of alternatives, and three types of impacts. They include:

- Actions (other than unconnected single actions) which may be:
    - Connected actions, which means that they are closely related and therefore should be discussed in the same impact statement. Actions are connected if they:
        - Automatically trigger other actions, which may require environmental impact statements.
        - Cannot or will not proceed unless other actions are taken previously or simultaneously.
        - Are interdependent parts of a larger action and depend on the larger action for their justification.
    - Cumulative actions, which when viewed with other proposed actions, have cumulatively significant impacts and should therefore be discussed in the same impact statement.
    - Similar actions, which when viewed with other reasonably foreseeable or proposed agency actions, have similarities that provide a basis for evaluating their environmental consequences together, such as common timing or geography. An agency may wish to analyze these actions in the same impact statement. It should do so when the best way to assess adequately the combined impacts of similar actions or reasonable alternatives to such actions is to treat them in a single impact statement.
- Alternatives, which include:
    - No Action alternative.
    - Other reasonable courses of actions.

  - Mitigation measures (not in the proposed action).
- Impacts, which may be: (1) direct, (2) indirect, or (3) cumulative.

Significance: As used in NEPA (§1508.27) requires considerations of both context and intensity:

- **Context.** This means that the significance of an action must be analyzed in several contexts such as society as a whole (human, national), the affected region, the affected interests, and the locality. Significance varies with the setting of the proposed action. For instance, in the case of a site-specific action, significance would usually depend upon the effects in the locale rather than in the world as a whole. Both short- and long-term effects are relevant.
- **Intensity.** This refers to the severity of impact. Responsible officials must bear in mind that more than one agency may make decisions about partial aspects of a major action. The following should be considered in evaluating intensity:
  - Impacts that may be both beneficial and adverse. A significant effect may exist even if the federal agency believes that on balance the effect will be beneficial.
  - The degree to which the proposed action affects public health or safety.
  - Unique characteristics of the geographic area such as proximity to historic or cultural resources, parklands, prime farmlands, wetlands, wild and scenic rivers, or ecologically critical areas.
  - The degree to which the effects on the quality of the human environment are likely to be highly controversial.
  - The degree to which the possible effects on the human environment are highly uncertain or involve unique or unknown risks.
  - The degree to which the action may establish a precedent for future actions with significant effects or represents a decision in principle about a future consideration.
  - Whether the action is related to other actions with individually insignificant but cumulatively significant impacts. Significance exists if it is reasonable to anticipate a cumulatively significant impact on the environment. Significance cannot be avoided by terming an action temporary or by breaking it down into small component parts.
  - The degree to which the action may adversely affect districts, sites, highways, structures, or objects listed in or eligible for listing in the National Register of Historic Places or may cause loss or destruction of significant scientific, cultural, or historical resources.
  - The degree to which the action may adversely affect an endangered or threatened species or its habitat that has been determined to be critical under the Endangered Species Act of 1973.
  - Whether the action threatens a violation of federal, state, or local law or requirements imposed for the protection of the environment.

Stormproofing: Agency term used to refer to relatively low-cost treatments on those NFTS roads and trails primarily open to the public and include actions such as replacing undersized culverts and cross drains, constructing diversion dips at road-stream crossings, water bars, out-sloping and broad-based drain dips depending on site-specific conditions, to reduce the chronic effects of roads (e.g., fine sediment delivery) and reduce the likelihood and consequences of catastrophic failures (e.g., diversion onto roads) associated with large storm events. These long-standing agency practices are applicable across extensive portions of the NFTS road network aimed at protecting aquatic resources and infrastructure. They are designed to complement the higher-cost treatments (e.g., putting level 1 roads into road storage, decommissioning, road realignments, redesigning of culverts for fish passage), typically implemented on relatively small segments of the network that pose a high or moderate risk to water quality and fisheries.

Traditional Cultural Property (TCP): A traditional cultural property, can be defined generally as one that is eligible for inclusion in the National Register because of its association with cultural practices or beliefs of a living community that (a) are rooted in that community's history, and (b) are important in maintaining the continuing cultural identity of the community.

Trail: A route 50 inches or less in width or a route over 50 inches wide that is identified and managed as a trail (36 CFR 212.1).

Travel management atlas: An atlas that consists of a forest transportation atlas and a motor vehicle use map or maps (36 CFR 212.1).

Unauthorized route (UAR): A route that is not a forest road or trail or a temporary road or trail and that is not included in a forest transportation atlas (36 CFR 212.1).

Acronyms

AC – Activity Center

ACHP – Advisory Council on Historic Preservation

APE – Area of Potential Effect

ARPA – Archaeological Resource Protection Act

BA – Biological Assessment

BE – Biological Evaluation

BLM – Bureau of Land Management

BMP – Best Management Practices

BO – Biological Opinion

BOS – Board of Supervisors

CDFW – California Department of Fish and Wildlife

CEQ – Council on Environmental Quality

CFR – Code of Federal Regulation

CVC – California Vehicle Code

CWHR – California Wildlife Habitat Relationships

DEIS – Draft Environmental Impact Statement

EA – Environmental Assessment

EIS – Environmental Impact Statement

EPA – Environmental Protection Agency

ESA – Endangered Species Act

FEIS – Final Environmental Impact Statement

FLPMA – Federal Land Policy and Management Act

FS – Forest Service

FSH – Forest Service Handbook

FSM – Forest Service Manual

IRA – Inventoried Roadless Area

LRMP – Land and Resource Management Plan

LSR – Late Successional Reserve

MAMU – Marbled Murrelet

MIS – Management Indicator Species

ML – Maintenance Level

MOU – Memorandum of Understanding

MUSYA – Multiple Use Sustained Yield Act

MVUM – Motor Vehicle Use Map

NAGPRA – Native American Graves Protection and Repatriation Act

NEPA – National Environmental Policy Act

NFMA – National Forest Management Act

NHPA – National Historic Preservation Act

NFS – National Forest System

NFTS – National Forest Transportation System

NOA – Naturally Occurring Asbestos

NOI – Notice of Intent

NRA – National Recreation Area

NRHP – National Register of Historic Places

NSO – Northern Spotted Owl

NTM – Neotropical Migrant

NVUM – National Visitor Use Monitoring

NWFP – Northwest Forest Plan

OHV – Off-Highway Vehicles

OML – Operational Maintenance Level

PA – Programmatic Agreement

PL – *Phytophthora lateralis*, or

PL – Public Law

POC – Port-Orford-cedar

RAP – Roads Analysis Process

RMO – Road Management Objective

RNA – Research Natural Area

ROD – Record of Decision

ROS – Recreation Opportunity Spectrum

SHPO – State Historic Preservation Officer

S&M – Survey and Manage

SHPO – State Historic Preservation Officer

SIA – Special Interest Area

SPNM – Semi-primitive Non-motorized

SPM – Semi-primitive Motorized

SRNF – Six Rivers National Forest

SRPM – Standard Resource Protection Measures

TAP – Travel Analysis Process

TCP – Traditional Cultural Property

TMO – Trail Management Objective

UAR – Unauthorized Routes

USDA – United States Department of Agriculture

USDI – United States Department of the Interior

USFWS – United States Fish and Wildlife Service

VQO – Visual Quality Objective

References Cited

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