
CHAPTER III - AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES

A. INTRODUCTION

This Chapter describes consequences and environmental effects linked with implementing the alternatives considered and analyzed in detail. The following sections portray affected environments and outcomes for each alternative in terms of attainment of Purpose and Need, and predicted physical, biological, economic, and social direct, indirect and cumulative effects on the environment, in regard to the Significant Issues and Other Issues identified in Chapter I. In presenting consequence discussions, the following terms are used to describe relevant spatial and temporal effects:

Short-term effects *address environmental consequences, which could occur at the time or and/or that arise within two-years of motorized use designation.*

Long-term effects *address environmental consequences, which are delayed, periodic, and/or arise more than two-years after motorized use designation.*

Direct effects *refer to consequences caused by the activities or events themselves, occurring concurrently and in the same location.*

Indirect effects *include consequences, occurring later in time or farther removed in distance from the point of contact, but are still reasonably foreseeable.*

Cumulative effects *address incremental environmental consequences resultant of multiple, past, present, and reasonably foreseeable future actions, regardless of land ownership, or which agency or person initiated the action (40 CFR 1508.7).*

This analysis of environmental effects for each alternative is based on the recognition of Federal laws, National policies, regional Standards and Guidelines, and compliance with the Rogue River and Siskiyou National Forest LRMPs, as amended by the Northwest Forest Plan. The Forest Service Interdisciplinary Team has conducted analysis and has disclosed environmental consequences for all alternatives considered in detail.

1. Analysis Framework

The baseline for the affected environments and environmental consequences described in the sections below is the existing condition as described in Alternative 1 (No Action). In general, this baseline includes existing National Forest System (NFS) roads and trails and unauthorized routes identified in the Forest route inventory, combined with isolated cross-country motor vehicle travel, existing seasonal closures, no restriction on wheeled over-the-snow travel, and no specific prohibitions on the use of public wheeled motor vehicles for parking and dispersed camping.

For the RRSNF, this project and its analysis has focused on the change from the current condition.

The depiction of effects varies, based on the context in which they are analyzed. Therefore, pertinent, environmental consequences are presented in context of multiple scales, over various timeframes. For the purpose of this Draft EIS, the analysis was focused at the scale of the entire Rogue River-Siskiyou National Forest and specifically where actions are proposed with resulting direct consequences. These areas are unique to the Action Alternatives and vary according to the area where potential actions would occur.

Data

The primary data source used for this analysis was existing Geographic Information System (GIS) data collected from past field surveys and inventories. The RRSNF has numerous GIS layers that contributed to conducting an effective analysis, such as: spotted owl activity centers, hydrologic watersheds, travel routes, vegetation, sensitive plant occurrences, Botanical Areas, and recorded cultural resource sites.

The second data source used for this analysis was collected in the field by the Forest resource specialists for this project. Field assessments on specific routes of concern were conducted by project specialists. These included all unauthorized routes proposed to allow use as NFS trails as proposed in Alternatives 3.

Assumptions for Analysis

For this analysis, the following assumptions apply to all analysis as documented in all sections below:

- The existing level of use of NFS roads and trails is part of the current condition. Maintaining the current level of use does not constitute a measurable change to the current condition and therefore does not constitute a new effect. This also applies to situations where roads may be technically closed due to their Maintenance Level 1 status, but are still physically open to motorized use and receive such use.
- A NFS road is managed as a road and a NFS trail is managed as a trail, and for this analysis, both are managed as part of the Forest infrastructure. Though species of plants or animals may occupy roads or trails, their presence does not convert the management of that road or trail to habitat management. Effects analysis acknowledges the presence of those species and thus effects on those species when any road or trail is put to its intended use.
- Public education and enforcement of regulations are assumed to be effective and would generally limit public travel to designated routes. Though illegal use at some level is expected to continue, unless site-specific documented information is available, the exact location and extent cannot be predicted.
- Reduction in the amount of available motorized trail may concentrate use on other trails that remain open to motorized use. However, because there is no information on the amount of use, it is assumed that additional use would not reach a threshold that would result in adverse resource effects.
- Routes with fixed barriers are closed and are expected to re-vegetate. The effects analysis assumes re-vegetation over time. Differences in time frame and ultimate composition of that re-vegetation may vary based on soil types and site conditions (aspect, rainfall, elevation, etc.)

- NFS roads and trails are assumed to be in an acceptable condition, unless information is documented to the contrary. This is based on the fact that most NFS roads and trails were constructed to a high standard based on an engineered design.
- NFS roads and trails designated for public wheeled motor vehicle use are and will continue to be maintained (brushing, ditch cleaning, etc.) as needed. Effects analysis assumes this ongoing maintenance.
- Hazard trees will be treated on NFS roads designated as open for motorized vehicle use. Hazard trees will not be treated on trails.
- Unauthorized or user created routes may not be in an acceptable condition, unless information is documented to the contrary. This is based on the fact that unauthorized routes were generally created without engineering design.
- The alternatives differ in terms of the miles of routes open to public motor vehicle travel; there is no difference in the number of miles of routes that currently exist.
- Cross-country (or off-road) travel is currently allowed on approximately 275,000 acres of the Rogue River-Siskiyou National Forest. Of those acres, the majority are not utilized due to topography and heavy vegetation. Based on analysis of the current condition, it is estimated that approximately 5% (13,750 acres) actually receive cross-country use.

Cumulative Effects Assumptions

The cumulative effects analysis area is described under each resource, and in most cases includes the entire Rogue River-Siskiyou National Forest, including private and other public lands that lie within the Forest boundary. Past activities are considered part of the existing condition. To understand the contribution of past actions to the cumulative effects of the Proposed Action and 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 future cumulative effects.

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 costly to obtain at the scale of the entire Forest. Current conditions have been impacted by many 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 each action over the last century that has contributed to current conditions. By looking at current conditions, the residual effects of past human actions and natural events can be recognized, regardless of which particular action or event contributed those effects.

The present and reasonably foreseeable actions potentially contributing to cumulative effects resulting from this project are fuel treatments and fire, range management, minerals management, recreation, timber harvest and vegetation treatments, reforestation, restoration projects, road and right-of-way management, state and county easements, special uses, and road construction and decommissioning.

B. ATTAINMENT OF PURPOSE AND NEED

As introduced in Chapter I, the content of the Purpose and Need statement is:

The *purpose* for action is to enact the Travel Management Rule. Motorized use is a popular use and is an important form of recreation for many individuals, families, and groups. A designated and managed system is *needed* to provide this use. Increased demand for motorized use, lack of designated areas/routes, and the inconsistent direction contained in the Forest Plans, has led to resource damage and social impacts, user conflicts, and safety concerns.

This Section is designed to take a closer look at the overall attainment of the Purpose and Need and establish indicators to compare the Action Alternatives in relation to the No Action Alternative. While components of Purpose and Need are related, either directly or indirectly, to the Significant Issues, this Section is not designed to assess consequences (effects) in terms of Significant Issues. It is designed to assess the overall attainment of the stated Purpose and Need. The three key elements of the Purpose and Need Statement are discussed below.

a. Enact the Travel Management Rule

The Action Alternatives (i.e., Alternatives 2, 3, and 4) would lead to the publication of a MVUM which would enact the Travel Management Rule. This would be accomplished via Forest-wide Plan Amendments that allow the MVUM to be the basis of allowable motorized use for roads, trails and areas, and to authorize the issuance of citations for use not in accordance with the MVUM.

The No Action Alternative (Alternative 1), as a status-quo alternative, would not result in the publication of a MVUM and thus would not enact the Travel Management Rule.

b. Provide a Designated and Managed System for Motorized Use

All alternatives provide, and to some degree, even the No Action Alternative provides for a managed system of motorized use. The Action Alternatives provide for a more succinct and easily understood system for motorized use than does the No Action Alternative. The Action Alternatives authorize the issuance of citations for use not in accordance with the MVUM.

The degree that the Action Alternatives provide for motorized use varies by alternative and is the subject of the Motorized Opportunities Significant Issue, discussed in the next section.

Generally, for the purpose of perspective, Alternatives 1 and 2 generally provide about the same extent of motorized use as the current situation, Alternative 3 is the Proposed Action, and provides a more managed and slightly reduced system, and Alternative 4 provides a more managed and more reduced system over Alternative 3.

c. Provide Consistent Direction in the Forest Plans

Forest-wide Plan Amendments proposed under the Action Alternatives would allow the MVUM to be the basis to display the allowable motorized use for roads, trails and areas, and to authorize the issuance of citations for use not in accordance with the MVUM.

Alternatives 2 and 3 also enact specific Plan Amendments as necessary, to provide for clear and consistent direction in the Forest Plans. These site-specific amendments are associated with the Boundary Trail and associated connecting trails, along the ridge associated with the (former) boundary of the Rogue River and Siskiyou National Forests. These amendments are needed for Alternatives 2 and 3, to allow the Forest Plans to provide consistent direction so that this trail would continue to be authorized for motorized use. Alternative 4 does not provide for motorized use on the Boundary Trail and therefore does not need these specific amendments.

The No Action Alternative, as a status-quo alternative, does not enact the Travel Management Rule, does not enact specific Plan Amendments for the Boundary Trail and therefore does not provide consistent direction via the Forest Plans.

C. ENVIRONMENT AND CONSEQUENCES ASSOCIATED WITH SIGNIFICANT ISSUES

Significant Issues were used to design specific elements of the alternatives and proposals, mitigation measures, and/or facilitate the display of important (and/or variable) environmental consequences. NEPA requires Federal agencies to focus analysis and documentation on the Significant Issues related to an action.

These issues (presented in Chapter I) have been determined to be significant because of the extent of their geographic distribution, the context of associated consequences, the duration of the effects, or the intensity of interest or resource conflict. Under the No Action Alternative, there would be no change from the current conditions (unless otherwise noted).

1. Water Quality and Erosion

Will motorized vehicle use on the Rogue River-Siskiyou National Forest (especially motorized trails) affect water quality via erosion or sediment delivery to streams or riparian areas?

The effect of roads and trails on hydrologic systems is usually analyzed both at the site-scale and at the watershed scale in order to evaluate direct impacts of the road alignment (site-scale) and the indirect and cumulative watershed effects. For this analysis, alternatives for motorized use have been analyzed at the site scale and the 6th field or “subwatershed” scale. Site-scale and basin-wide effects and mechanisms are described below as they have been considered in the hydrologic analysis.

¹ The United States is divided and sub-divided into successively smaller hydrologic units which are classified into four levels: regions, sub-regions, accounting units, and cataloging units. The hydrologic units are arranged within each other, from the smallest (cataloging units or watersheds) to the largest (regions). Each hydrologic unit is identified by a unique hydrologic unit code (HUC) consisting of two to eight digits based on the four levels of classification in the hydrologic unit system. A watershed is considered to be a 5th field unit and a subwatershed is a 6th field.

EIS Appendix D documents more detail on the 5th and 6th field watersheds that have been analyzed. These subwatersheds are analyzed because they represent those watersheds where actions are being proposed to occur that would potentially affect (either adversely or beneficially) current conditions. EIS Appendix D (incorporated by reference) includes watershed characteristics, risks for adverse cumulative effects, Key Watershed and water quality listing status, and Riparian Reserve status.

a. Background and Analysis Framework

The alternatives contain road use changes that eliminate or designate mixed use on specified roads. Roads proposed for closure to public use have been evaluated in this analysis since the level of use would change from unregulated public use to limited administrative use or use by permit only. The conversion of Maintenance Level 1 roads to motorized trails has been evaluated even though the level of current use is expected to remain approximately the same.

See the assumption section at the beginning of Chapter III for a general list of assumptions. The following list is specific to the analysis of the effects of roads and trails on potential for water quality and erosion on the Rogue River-Siskiyou National Forest:

- A stream with adverse effects to water quality as a result of sediment from unpaved roads and trails (or other causes) generally shows one or more of the following characteristics: pools have been partially or completely filled-in with sediment, an excessive amount of fine-grained material occurs throughout much of the channel, the channel is wide and shallow, recent erosion of the channel is excessive, the streambanks are unstable.
- The reduction or elimination of motorized vehicle traffic on a road or trail near a stream will result in less sediment delivered from the road to the stream, and this in turn will reduce the risk of adverse effects to water quality from roads. This is because the reduction or elimination of vehicle traffic on a road or trail, over a period of time, would re-vegetate with grass, shrubs, or trees. As result, the amount of material that is readily available to erode from the road to a nearby stream should be reduced. The available research has shown that the erosion rates from a closed road will often decrease to near background levels as the density of vegetation on the surface of the road increases (Dissmeyer 2000).
- The elimination of motorized vehicle traffic on a road or trail near a stream during periods of wet road conditions will result in less sediment delivered from the road to the stream. Vehicle use on wet roads tends to cause ruts and damage to the roads, which tends to increase erosion of sediment from the road during rainfall events and periods of snowmelt.
- The density of roads and trails at the watershed scale will not be substantially changed as a result of any of the Action Alternatives (Alternatives 2, 3, and 4). The primary reason for this assumption is that these alternatives involve the closure of routes to vehicle use by the public and not the physical removal of roads. The removal of roads typically involves the excavation of culverts, the ripping of the road surface, and, in some cases, the re-contouring of the ground surface to blend in with the natural topography.

- Ongoing monitoring would identify any roads or tails presenting a potential sediment source. Mitigation of impacts due to road alignment, slope instability, or poor drainage would occur through the Forest's standard road maintenance schedule.

b. Effects Mechanisms

Water Temperature

Roads affect water quality directly through sediment supply and by lack of canopy that may reduce stream shading and contribute to increased water temperature in perennial streams. Elevated water temperatures are common during the summer low-flow stream conditions and are the result of a variety of natural and human-caused factors. Water quality effects of National Forest management activities are governed by a Memorandum of Understanding with the State of Oregon. On the Rogue River-Siskiyou National Forest, most of the listed streams are listed as impaired for water temperatures that exceed State standards.

The Forest Service and the Oregon Department of Environmental Quality seek to improve this condition through Best Management Practices (1977) and through the Aquatic Conservation Strategy (ACS) contained in the Northwest Forest Plan (1994). Forest-wide implementation of BMPs and the ACS are generally accepted by the State of Oregon as a management approach that will maintain or allow attainment of water quality standards.

Sediment

Numerous researchers have established that roads are the primary source of fine sediment delivered to streams in otherwise relatively undisturbed watersheds, such as forests and rangelands. In addition, research has concluded that fine sediment from roads can result in adverse effects to streams and aquatic habitat (MacDonald and Stednick 2003; Gucinski et al. 2001; Dissmeyer 2000; Meehan 1991).

Road related sedimentation is a result of road-induced hydrologic changes. The hydrology of road networks has important implications for both road surface sediment production (Coe and McDonald 2001) and mass-wasting (Montgomery 1994; Veldhuisen and Russell, 1999; Wemple et al. 2001). Fine tuning road design and road maintenance Best Management Practices (BMPs) to avoid excessive water concentration and erosive power is an important step toward avoiding excessive road sedimentation. This may require improved drainage spacing specifications for unstable lithologies, or saturated areas.

Change in Flow Timing, Volume, or Duration

Overland flow occurs whenever rainfall intensity exceeds the infiltration capacity of the soil. In humid, forested landscapes rainfall intensity rarely exceeds infiltration capacity, and overland flow occurs infrequently (except where heavily compacted). In contrast, road surfaces are highly compacted, have high bulk densities, and have little or no pore space (Luce 1997). Although roads occupy a very small percentage of most watersheds, they can be responsible for the majority of overland flow in forested basins. Road surfaces can also produce runoff in the majority of storm events (Ziegler et al. 1997).

Hillslope runoff processes in the Pacific Northwest are dominated by subsurface stormflow. Subsurface stormflow occurs when permeable soil overlies relatively impermeable bedrock. Since roads are typically cut into the soil profile, and sometimes into underlying decomposed and solid bedrock, roads are capable of intercepting, concentrating, and rerouting subsurface stormflow from upslope contributing areas.

Studies have shown that interception of subsurface stormflow is responsible for over 90% of the runoff from roads in the Pacific Northwest (LaMarche and Lettenmaier, 2001; Wemple and Jones, 2003). Roads with deep road cuts and roads constructed on shallow soils are especially prone to intercepting subsurface stormflow. Road cuts that do not expose the entire soil profile and roads constructed on benches are less likely to intercept subsurface stormflow (Wemple and Jones, 2003).

Published research has not established consistent numerical criteria for determining when roads are likely to contribute sediment to streams and other aquatic features such that the water quality of those features is adversely affected. Direct, quantitative, cause-and-effect links between roads and trails and aquatic conditions have been difficult to document (Gucinski et al. 2001). As a result of these limitations, the analysis of the alternatives in this section is a relative risk assessment of the likelihood of adverse effects to water quality and from erosion on the RRSNF.

c. Direct and Indirect Effects of Alternatives

The Action Alternatives contain Forest Plan Amendments designed to provide management and enforcement consistency. These amendments would change the Rogue River-Siskiyou NF travel policy from “cross-country travel allowed unless designated closed” to “cross-country travel prohibited unless designated open”. Widespread and unregulated cross-country travel on the Rogue River-Siskiyou NF is a fairly rare problem due to the challenges of operating vehicles in the difficult terrain presented by the Forest’s dense vegetation and irregular topography.

Dispersed camping is inherently associated with roads and generally within the same zone of impact. Dispersed camping is unlikely to generate significant watershed impacts over and above those associated with roads. Action Alternatives include prohibitions for damage to land, vegetation, or streams including the cutting of trees. Under these conditions dispersed camping activities would have no more than a localized, short-term and indirect effect on aquatic resources.

The following discussion presents effects by specific Ranger Districts, with a focus on the action elements as associated with the Proposed Action and Alternative 4.

Powers Ranger District

Under **Alternative 1 (No Action) and Alternative 2**, the status of the roads (portions of Roads 3353320, 3353323, 3353330, 3353350, 3353370, 5201350, and 5201380) and motorized trail (#1258) in the proposed Copper Salmon Wilderness would remain unchanged. These roads are located above the North and South Forks of the Elk River, at least a mile above anadromous fish barriers.

Road associated landslides have occurred at ten known locations; unstable features would continue to be subject to low levels of administrative use and maintenance. Passive recovery in the form of natural revegetation of these roadways would tend to progress as long as use is light.

The majority of the subject roads are on or near ridgelines with few stream crossings. Roads with these characteristics have the lowest risk of erosion. There are approximately 4 miles of mid-slope roads that have a number of crossings that have a high risk of erosion and instability. Although these roads would continue to recover passively, they pose a higher risk of persistent road-related drainage and fill failure. The designation of this area under the proposed Copper Salmon Wilderness would not physically close the roads. However, motorized use on these roads would be prohibited by the designation of this area as Wilderness.

Under **Alternative 3 (Proposed Action) and Alternative 4**, the roads and a motorized trail in the Upper Elk subwatershed would be closed to motorized use by the public. Most of the roads are located on or near ridgelines, or have alignments that follow slope contours. These roads have a minor effect on watershed hydrology; therefore their closure would be unlikely to yield detectable effects at the watershed scale. However, there would be site level beneficial effects.

Mid-slope position roads proposed for closure to motorized use by the public total approximately 4 miles. Roads in the North and South Fork of the Elk River drainages have the highest risk of modification of natural drainage patterns and of generating sediment that could reach the mainstem. These roads contain at least six perennial stream crossings and numerous ephemeral channel crossings, and, have a history of localized landslide activity. Closure to public motorized use could contribute to vegetative recovery that would gradually reduce this source of road related runoff. This would reduce road-generated sediment sources to the forks of the Elk River.

The trails are located at elevations that are rain-dominated and experience high rainfall intensities. Trail related erosion would be expected to be high under these climate conditions but the closure of these trails to motorized use would reduce the risk of sediment from the trails and allow for passive recovery.

Sediment from the few and relatively small sources presented by the subject roads and trails is unlikely to be detectable at the subwatershed level. Sediment levels along the mainstem of the Elk River and associated forks would mask such a small contribution from roads in the headwaters that are drained mainly by first order ephemeral or perennial channels.

Because this action would merely designate portions of a paved road for mixed use, there would likely be no effect. Any change would be undetectable. The proposed activity would merely redefine the type of vehicle that is permitted to drive on a portion of Forest Road 3348.

Gold Beach Ranger District

Motorized trails (Trails 1169 and 1173) have few stream crossings within their 10.5 mile extent. Crossings are avoided since the trail drops directly down the canyon slope to cross Lawson Creek. The trail is located at elevations that are rain-dominated and experience unusually high rainfall intensities. Trail related erosion would be expected to be high under these climate conditions.

Under **Alternative 1 (No Action) and Alternative 2**, motorized access would continue over steep, un-maintained trails (average gradient 16-18%) on erodable soils and landforms, under conditions of high/intense rainfall. Risk of erosion of the travelway and contribution of sediment directly to Lawson Creek is severe considering the environmental conditions, steepness of the trail, and the soil displacement potentially generated by OHVs. Lawson Creek is impaired for temperature and is within a Key Watershed. Therefore continued use of these trails by motorized vehicles would not be consistent with ACS objectives at the site scale.

Under **Alternative 3 (Proposed Action) and Alternative 4**, conversion of the motorized trails to non-motorized use would eliminate slope vegetative cover removal and erosion (soil displacement, travel-way rills) generated by vehicle use on steep ground. Existing ruts and exposed soil would recover passively. Alternative 4 would further reduce the amount trails open to motorized use as compared to Alternative 3.

Pedestrian/livestock trail use is likely to be light due to the steep trail gradient and remote nature of the area; these characteristics would promote passive recovery in the short term, reducing the risk of sediment from the trail entering Lawson Creek. Over time, this local sediment source would be expected to decline to natural levels.

Forest Road 3680351 and 3680353 were evaluated in the Lawson Creek Watershed Assessment (1997). These roads were rated as a low to moderate sediment source and a low risk of increasing peak flows. These roads are located on or near the top of a ridge with only a single ephemeral stream crossing. Though identified as a Maintenance Level 1 roads (closed), these roads are receiving use by OHVs.

Forest Road 3680409 follows the divide between Lawson Creek and Collier Creek watersheds. This road has a very low potential for erosion due to its position along the divide and corresponding isolation from riparian area or to streams.

Forest Road 3318310 runs parallel to contour in most locations and crosses numerous perennial tributaries to Lawson Creek; it is located within the Riparian Reserve along the upper North Fork of Lawson Creek, within 100 feet of the stream at one location.

These roads would be closed to motorized use under **Alternative 1 (No Action), Alternative 2, and Alternative 4** and would be expected to gradually reduce road related sediment through passive vegetative recovery.

Under **Alternative 3 (Proposed Action)**, conversion of Maintenance Level 1 roads (3680351 and 3680353) to motorized trails in the Snow Camp Mountain area would allow continued motorized use. Erosion and rutting can result from excessive use of this type. This portion of the road has no stream crossings and is more than 1,000 feet from the nearest perennial channel. The risk of generating road related runoff that increases peak flows or delivers sediment to the stream system is low.

Conversion of Forest Road 3680409 to a motorized trail would have a very low potential for erosion due to its position along the divide and corresponding isolation from Riparian Reserves.

The conversion of Forest Road 3318310 to motorized trails would open an existing storm-proofed road. The Lawson Creek Watershed Assessment identifies that a portion of the North Fork Lawson Creek adjacent to the proposed motorized trail be evaluated for stream restoration, suggesting that the existing road/stream configuration may be adversely affecting riparian function. As the road and associated drainage features degrade due to minor rutting associated with motorized trail use, sediment and runoff are likely to increase over the long term. Maintenance should offset this effect. Generated sediment could easily reach Lawson Creek from the 30 channel crossings, or through new rills and gullies generated by road use and uncontrolled drainage.

Alternative 3 would open Maintenance Level 1 roads located along the shared watershed divide between the Upper Hunter Creek, Lower Rogue River-Gold Beach and Quosatana subwatersheds.

The Proposed Action would also open Maintenance Level 1 roads entirely within the Quosatana Creek subwatershed. The Proposed Action would not directly change road densities in any of these watersheds since the roads are already present; however, closed roads in the coastal areas tend to re-vegetate rapidly. Road related impacts diminish rapidly as roadbeds are invaded by understory plants and forest canopy closes.

For the Quosatana subwatershed, site specific impacts are expected to be low due the high position of the road in the watershed and the small number of both ephemeral and perennial stream crossings.

Generally, the road is on gentle slopes at or near a ridgetop position. An exception is where Forest Road 3313110 follows a perennial stream channel for 1,400 feet on an average grade of 10%. This alignment would be of concern because it presents an extended opportunity to deliver road related runoff and sediment to enter the stream system.

Proposed trails located along the common subwatershed divides of Quosatana, Lower Rogue-Gold Beach and Hunter Creek (3313, 3313113; 3680, 3680190, 3680195 and 3680220) are on or near the watershed divide or ridgetop, and descend gradually about 500 feet in elevation, generally along the slope contour. Channel crossings are few and are near the uppermost extent of ephemeral streams. Small amounts of sediment transport could occur at these stream crossings but are unlikely to be detectable at downstream perennial channels.

Under **Alternative 1 (No Action), Alternative 2, and Alternative 4**, the existing trail would remain as a motorized trail. However, under Alternative 2, as an unauthorized trail, it would not be identified as a motorized trail, therefore, there would be no use. Few hydrologic issues are associated with the current alignment. The trail's current contribution to sediment is likely to be undetectable.

Under **Alternative 3 (Proposed Action)**, the proposed trail has few hydrologic issues since it is in the same vicinity as the existing user-created trail. Localized surface rutting may occur on steep portions of the trail, but watershed effects would be undetectable.

This action would result in no change to the current condition. The current road network would be maintained in its existing condition, with street legal motorized use continuing.

Wild Rivers Ranger District

Under **Alternative 1 (No Action) and Alternatives 2 and 4**, Forest Road 4402494 would remain closed and largely unused. The position of the road along the ridgeline allows it to have low to negligible effect on hydrologic processes either at the site or subwatershed (Baldface Creek) scale.

Under **Alternative 3 (Proposed Action)**, Forest Road 4402494 would be opened to motorized use as a trail. The position of the road along the ridge and the rocky character of the terrain indicate that little resource damage would be expected as a result of motorized use of the road.

Under **Alternative 1 (No Action)**, and **Alternative 2**, the trails in the Upper and Lower Briggs Creek and Silver Creek subwatersheds would continue to be designated for motorized use. At the site scale, these routes are relatively benign (in terms of alteration of hydrologic flow and erosion) on those portions that run on or near ridgelines. Much of the area is dominated by bedrock outcrop and is resistant to erosion. The Watershed Assessment (1995) identifies the inner gorges of stream canyons that often have over-steepened slopes and landslides as potential sediment sources.

Riparian Reserves with perennial streams draining into impaired streams are of concern where influenced by motorized use. An area of high risk is located where the trail crosses Swede Creek at the location of an inventoried landslide. This is a potential point source for sediment that would be deposited directly into a perennial channel. Briggs Creek is downstream 0.75 miles and is listed as impaired for temperature. Other areas of concern would be the seven perennial stream crossings in the Horse Creek-Secret Creek area that also drain to Briggs Creek.

The lower portion of the trail into Silver Creek has several crossings and also runs within the Riparian Reserve for almost half a mile. Although Little Silver Creek is not a listed stream, motorized use in Riparian Reserves is not consistent with management objectives for maintaining or enhancing riparian resources under the ACS, especially since Silver Creek is in a Key Watershed. Forest Road 2600050, positioned near Silver Creek, is about one river mile upstream of the listed portion of Silver Creek.

Under **Alternative 3 (Proposed Action) and Alternative 4** the trails in the Upper and Lower Briggs Creek and Silver Creek subwatersheds would be closed to public motorized use. This would alleviate the majority of sediment production described under the No Action Alternative. Trails would experience sediment generated by non-motorized traffic. This would be expected to be minor and undetectable based on expected light use.

Under **Alternative 1 (No Action) and Alternative 2**, the Kings Saddle, Bolan Lake, Bigelow Lake, and Mt. Elijah trails would continue to be motorized. Since these trails are located along the high ridges of the watershed, they would have little influence on hydrologic characteristics at the subwatershed level.

Stream crossings are at the extreme upper end of the perennial system and there is little connectivity otherwise. Minor erosion and sediment input to the channel would be expected to result from motorized use at stream crossings. Sediment is unlikely to be substantial enough to change downstream characteristics. Slope ravel would be expected along steep portions of the trail, but is unlikely to generate landslide activity.

Site scale indirect short and long term impacts to wetlands and lakes as a result of motorized access are likely to continue. Damage to wetland vegetation and bank stability due to vehicle passage is common on accessible wetlands. Lakes and wet areas would generally capture sediment, preventing or slowing its downstream travel. Vehicle use in wetland areas can change morphological and drainage characteristics that affect the extent of the wetland and its ability to filter out sediment.

Under **Alternative 3 (Proposed Action) and Alternative 4**, closure of the Kings Saddle, Bolan Lake, Bigelow Lake, and Mt. Elijah trails would have a minor, localized beneficial effect resulting from a reduction in the small amount of erosion generated by motorized use. No long or short-term effects at the subwatershed scale would be detectable. Closure of the trails would have an indirect beneficial effect on wetland integrity by preventing damage associated with vehicle use (as described for Alternative 1).

Under Alternative 4, the closure of the Boundary Trail and its connecting trails to motorized use would have a minor, localized beneficial effect resulting from a reduction in the small amount of erosion generated by motorized use.

Under **Alternative 1 (No Action) and Alternative 2**, Roads 2600050, 4300011, 4300910, 4300920, 4300925, 4400445, 4400459, 4400460, 4400461, 4400480, 4201016, and 4103011 would remain open to public use. At the subwatershed scale these roads have a minimal contribution to road densities of their subwatersheds.

They would have a low potential for sediment contribution based on their level gradient and lower slope position in the watershed. At the site scale, most of the affected roads are within the Riparian Reserves of Josephine Creek, the Illinois River, and Deer Creek.

Under **Alternative 3 (Proposed Action) and Alternative 4**, these roads would be closed to public use. Alternative 4 would further reduce the amount of roads open to public use. Closure would result in a reduction of road-related impacts due to use, but would not remove the long term impact of maintaining roads within Riparian Reserves. Closed roads often receive little or no maintenance until needed for administrative use. Some passive recovery would be expected to mitigate the impact of these roads within the Riparian Reserve; however, impacts related to road drainage and canopy reduction would be expected to persist unless the roads are decommissioned.

Major channels in the area are listed for temperature impairment that results from both natural and human-caused conditions. Due to the naturally sparse vegetation and high summer temperatures, closure of the road to public use would not be expected to have a substantial restorative direct effect either in the long or short term.

If a closure protects wetlands in the general area from off-road traffic this would contribute to “off-channel” wetland stability and vegetative cover. This would have the small but beneficial effect of retaining water in the watershed that supports isolated riparian areas; however, the hydrologic effect on the subwatershed as a whole would be expected to be small since connectivity is low.

This action would result in no change to the current condition. The current road network would be maintained in its existing condition, with street legal motorized use continuing under all **Action Alternatives**.

Siskiyou Mountains Ranger District

Under **Alternative 1 (No Action) and Alternative 2**, the Horse Camp Trail and the Cook and Green Trail would remain open to motorized use, providing motorized access into a high elevation, glacial cirque lake area with steep, barren, but stable surrounding slopes (Middle Fork Applegate Watershed Assessment 1997).

These trails would be expected to generate slope ravel from OHV passage on steep slopes. Portions of the trail may also contribute to instability on earthflow terrain known to be in the Butte Fork subwatershed. Within riparian areas, the trails may have a damaging short and long term effect on bank stability and drainage patterns. Sediment would be expected to reach perennial streams where the trail crosses or is parallel to channels. Sediment from these sources may be undetectable at the watershed level when masked by other sources from the Middle Fork drainage.

Sediment from a landslide event could have a substantial short and long term direct effect on downstream channels as sediment settles into flood deposits that alter stream morphology. Since this is a natural process occurring within the watershed, it would be difficult to quantify the direct contribution of a particular source.

Debris torrents are common in steep streams of the Middle Fork, and watershed analysis documents sedimentation in the Lower Middle Fork resulting from road building on steep canyons, and from mining. It is reasonable to conclude that the Horse Camp Trail is a contributor in a high-sediment generation stream system.

Damage to Echo Lake due to OHV access and increased recreational use is an indirect short and long term effect of the nearby motorized trail. Localized damage to riparian area vegetation and drainage patterns is likely to continue under this alternative, especially since the trail does not receive regular maintenance. The lake would be expected to capture sediment it receives; therefore this indirect effect would not be detectable at the subwatershed level.

Under **Alternative 3 (Proposed Action) and Alternative 4**, closure of the Horse Camp Trail to vehicle traffic would eliminate a source of localized disturbance that generates erosion and sediment, and damages riparian function. The potential to contribute to the instability of existing landslide features is also reduced. Closure of the Horse Camp Trail would reduce a localized, indirect (long and short term) impact of vehicle access to the Echo Lake riparian area. Disturbance to riparian vegetation and lake banks would be reduced to that resulting from pedestrian use. Over the long term, damage caused by vehicle passage would recover passively.

Under Alternative 4, the Cook and Green Trail would be closed to motorized use in addition to the Horse Camp Trail. The motorized trail system in the Mule Mountain areas would also be closed to motorized use. This would eliminate a source of localized disturbance that generates erosion and sediment, and damages riparian function. Disturbance to riparian vegetation and lake banks would be reduced to that resulting from pedestrian use. Over the long term, damage caused by vehicle passage would recover passively.

Water quality is currently good with no impaired streams and would continue under the Proposed Action and Alternative 4.

Under **Alternative 1 (No Action), Alternative 2, and Alternative 4**, the existing trail alignment would remain. Few hydrologic issues are associated with the current alignment. The trail is in a low precipitation area where there are no State-listed streams. The trail's contribution to sediment in Squaw Creek is likely to be undetectable.

Under **Alternative 3 (Proposed Action)**, the proposed realignment has few hydrologic issues since it is in the same vicinity as the existing alignment. Slope ravel and soil displacement are generally associated with motorized trails; however the travelway is in a low precipitation zone with no riparian crossings. Localized surface rutting may occur on steep portions of the trail, but watershed effects would be undetectable.

High Cascades Ranger District

This action is only proposed under Alternative 3. The location of the proposed activity is flat terrain within an existing borrow pit. Due to the flat terrain, effects to hydrology are expected to be very localized, and mostly contained within the pit. Alternatives 1, 2, and 4 do not propose the development of a new play area on the High Cascades Ranger District.

Because this action (under Alternative 3) would merely designate portions of a paved road for mixed use, there would likely be no effect. Any change would be undetectable. The proposed activity would merely redefine the type of vehicle that is permitted to drive on portions of Forest Roads 34, 37, 3705, and 3720. Alternatives 1, 2, and 4 do not propose the designation of mixed use on paved roads on the High Cascades Ranger District.

d. Cumulative Effects

At the 6th field subwatershed scale, the risk for cumulative effects would not change as a result of limiting public access or converting roads to motorized trails under any of the alternatives in this DEIS. The reasons for this conclusion include:

- The Action Alternatives involve only minor amounts of new ground-disturbing activities and there would be no creation of new impervious areas. On the watershed scale, these changes would be immeasurable.
- Under all of the Action Alternatives, the closure of roads does not involve the physical removal of those roads and rehabilitation of the ground surface that those roads occupied.

- At the 6th field subwatershed scale, the acres of roads that would be closed to the public under all of the Action Alternatives - even assuming complete re-vegetation of the roads at some point in the future - is not enough to change the risk of cumulative effects.

The elimination of cross-country travel in Alternatives 3 and 4 would improve subwatershed conditions in those areas where cross-country travel is occurring and thus reduce the risk for adverse cumulative effects.

Other actions and activities that have the potential to have cumulative effects to the hydrologic resource include fuel treatments and fire, range management, minerals management, recreation, timber harvest and vegetation treatments, road and right-of-way management, special uses and state and county easements.

Fuels reduction projects and prescribed fire are on-going across the forest. Project designs to protect water resources greatly minimize or avoid direct effects, and they are typically short-term. Effects on water resources from motorized use activities would remain at current levels with Alternatives 1 and 2, and potentially decrease with Alternatives 3 and 4 through elimination of cross-country travel and establishment of designated routes. Therefore there are no foreseeable adverse cumulative effects.

Livestock grazing is a use that is managed under special use guidelines. The actions proposed in this project would not alter the grazing pattern or management of the livestock, and would therefore not include adverse cumulative effects.

Mining activities typically cause disturbance to the soil resource through the removal and/or displacement of vegetation and soil, and long-term commitments for access. Adverse cumulative effects to water resources from future minerals development have the potential to increase at the Forest-level in all alternatives. However at this scale, these effects would be immeasurable. Alternative 4 would offset any effects the most through the beneficial consequences of eliminating motorized trails through Botanical Areas and areas with serpentine soils, in addition to the elimination of cross-country travel in Alternatives 3 and 4.

The greatest recreation effects to water resources are typically tied to activities involving roads, trails, campgrounds, and dispersed sites. These are areas that result in varying levels of hydrologic impacts from those activities. Varying levels of hydrologic impacts can also occur from motorized recreation activities off-roads and trails. Impacts on water resources from motorized use activities would remain at current levels with Alternatives 1 and 2, and potentially decrease with Alternatives 3 and 4 through elimination of cross-country travel and establishment of designated routes. Therefore there are no foreseeable adverse cumulative effects. Additional effects would be offset by the elimination of motorized trails through Botanical Areas and areas with serpentine soils in Alternative 4. Cumulative effects would also potentially be offset by eliminating off-road parking for dispersed camping and day use beyond 300 feet from designated roads in Alternatives 2, 3 and 4.

Vegetation and timber harvest projects across the Forest are ongoing. Implementations of these projects require adherence to BMPs and Standards and Guidelines designed to protect and maintain the hydrologic resource. Detrimental effects to water resources from motorized use activities would remain at current levels with Alternatives 1 and 2, and potentially decrease with Alternatives 3 and 4 through elimination of cross-country travel and establishment of designated routes. Therefore there are no foreseeable adverse cumulative effects.

Proposals for special use permits and the action of granting an easement typically do not directly affect hydrology. Detrimental effects to water resources from motorized use activities would remain at current levels with Alternatives 1 and 2, and potentially decrease with Alternatives 3 and 4 through elimination of cross-country travel and establishment of designated routes. Therefore there are no foreseeable adverse cumulative effects.

2. Botanical Areas and Special Plant Habitats

Will motorized vehicle use on the Rogue River-Siskiyou National Forest affect Botanical Areas and/or special botanical habitats such as serpentine terrain, meadows, fens, and bogs?

Botanical Areas and/or special botanical habitats such as serpentine terrain, meadows, fens, and bogs are identified as a Significant Issue for motorized vehicle use designation on the Rogue River-Siskiyou National Forest. Of special concern are motorized trails and the effects that current and/or proposed use may have on these resources.

a. Background

Botanical Areas

Many of the Botanical Areas on the Forest currently have roads and trails going through them. The Siskiyou NF LRMP confines vehicle use to roads and trails. Some of the Siskiyou NF trails in Botanical Areas have been closed to motorized use and some have not.

The Rogue River NF LRMP confines vehicle use in Botanical Areas to roads only; motorized use of trails in Botanical Areas is not allowed. However, no CFR closure order has ever been issued to prohibit this use in all Botanical Areas covered by the RRNF LRMP. Consequently some trails within these Botanical Areas are used by OHVs, such as the Boundary Trail, the O'Brien Creek Trail, and the Cook and Green Trail.

Special Plant Habitats

Habitats such as meadows, wetlands, riparian areas, serpentine savannah, high mountain slopes, etc. often support rare or unusual plant species, easily disturbed bryophyte and lichen floras, or plant communities with high species richness. Where these habitats occur outside of Botanical Areas or RNAs or Wilderness Areas (where no motorized use is allowed) they can experience deleterious effects of off-road/off-trail OHV use if they are in areas that are accessible to these vehicles.

Serpentine (peridotite) habitats have a particularly high proportion of endemic plants (species whose distribution is restricted to limited geographic areas) and rare plants. Away from the more maritime portions of the Forest, Port-Orford-cedar is more prevalent on serpentine soils than on other soil types and because of the management history, is more likely to be uninfected with Port-Orford-Cedar root disease than on other soil types. Because they are often relatively open, serpentine areas may be more accessible to off-road/off-trail motorized use than areas on other soil types which are typically more heavily vegetated.

Although serpentine soils are not particularly sensitive to surface erosion, the slow rate of revegetation on serpentine soils means disturbed areas may recover slower than elsewhere. For these reasons, and in response to public comments received during Scoping, a proposal to restrict motorized use in serpentine areas to roads only (no trails, no cross-country) is included as part of Alternative 4.

Some special plant habitats are designated in specific places on the Forest as part of a national system of federal Research Natural Areas (RNAs). No roads go through any of the RNAs on this Forest. A number of RNAs have trails going through them. Neither LRMP allows motorized use of trails in RNAs, and off-trail use is also prohibited. However, since no Forest Order has ever been issued to prohibit it, motorized use of the Boundary Trail currently occurs where it passes through the west end of the (proposed) Oliver Matthews RNA.

b. Effects Mechanisms and Analysis Framework

For a list of general assumptions with regard to this analysis refer to the beginning pages of Chapter III. The following list is specific to the analysis for Botanical Areas and special plant habitats.

- Motorized vehicle use on and off established routes has affected or has the potential to affect Botanical Areas and special plant habitats, either directly by damage or death to individual plants from wheel-traffic (stem breaking, crushing, etc.), or indirectly by altering the habitat through soil disturbance, changes in hydrologic functioning, or by the introduction of non-native, invasive plant species that can out-compete native species for water, sunlight, and nutrients.
- Motorized vehicle use is more likely to impact other special plant habitats such as meadows that exist on gentle slopes or flat terrain with little or no vegetation or natural barriers to motor vehicles.
- Impacts to Botanical Areas and special plant habitats vary across all alternatives and no alternative completely eliminates the potential for adverse affects to them. In general, alternatives with fewer miles of routes open for public wheeled motor vehicle use should have reduced effects to special plant habitats.

c. Direct and Indirect Effects of Alternatives

Botanical Areas

Siskiyou Portion of the RRSNF

On the area covered by the Siskiyou NF LRMP, there would be no change in the status of trails in Botanical Areas under **Alternatives 1 and 2**. Effects would continue to be the same.

Alternative 3 would close the Bigelow Lakes Trail and the Bolan Lake Trail to motorized use within their respective Botanical Areas. Alternative 3 would also close to public motorized use, a primitive road (Maintenance Level 2) around the west and northwest sides of the Eight Dollar Mountain Botanical Area (Forest Road 4201881).

Further, this alternative would disallow mixed use on several roads in the Days Creek Botanical Area, and would close a primitive road in the Oregon Mountain Botanical Area. This would result in the recovery of habitat and likely increase plant populations.

Alternative 4 would accomplish the same road closures as Alternative 3 within Botanical Areas. Also under Alternative 4, any additional trails that may currently be open to motorized use in other Botanical Areas would become non-motorized.

The road closures and restrictions in the Eight Dollar Mountain Botanical Area and Day's Creek Botanical Area under **Alternative 3** are expected to reduce illegal off-road and off-trail OHV use and lead to recovery of habitat and increase populations of some native plant populations and native plant communities at Star Flat and some meadow and serpentine savannah locations in these Botanical Areas.

The Bigelow Lakes Trail closure under **Alternative 3** may enhance the recreational experience of some Botanical Area visitors and further discourage any illegal off-road and off-trail OHV use that could affect meadows and wetlands in a couple areas adjacent to the trail. The Bolan Lake Trail closure under Alternative 3 may enhance the recreational experience of some Botanical Area visitors.

Alternative 4 would be expected to have the same beneficial effects to botanical resources and recreation experience of some Botanical Area visitors, and for additional trails in other Botanical Areas as well.

Rogue River Portion of the RRSNF

Current use within Botanical Areas would continue under **Alternatives 1, 2, and 3**. Though it currently occurs in isolated areas, under these alternatives, there is potential for OHV operators to venture off-trail and consequently cause damage to some rare plants or their habitat, or cause other resource damage.

Off-trail use by OHVs would not have effects on areas adjacent to the Cook and Green Trail, because there are no vulnerable special status plant populations along this trail and no real opportunities to get off the trail exist. However, off-trail use could cause adverse effects in the Grayback Botanical Area, both in the wet Krause Meadow where *Gentiana plurisetosa* (a FS Sensitive species) grows, and in the Sugarloaf/Windy Gap area where the soil is easily erodible and has required gully stabilization in the past. The risk of direct adverse effects to plant habitat is relatively high due to the ease of leaving the trail at this location.

Motorized use of trails in Botanical Areas would not be allowed under **Alternative 4**. For this reason, OHVs are not likely to be present, so there is less likelihood they would go off-trail and damage Botanical Area resources.

Special Plant Habitats

Under **Alternative 1 and 2**, approximately 275,000 acres of Forest System land is available for off-road/off-trail motorized use, though in reality only a fraction of that is actually accessible.

Under **Alternatives 3 and 4**, uncontrolled off-road/off-trail OHV use would not be allowed on the Forest and, by implementing and enforcing the Travel Management Rule, damage to these habitats from off-road/off-trail use is not expected to occur.

Also, under **Alternative 4**, motorized use would be prohibited on trails within serpentine areas and Inventoried Roadless Areas, further reducing the potential for off-trail motorized use and potentially further limiting the spread of Port-Orford-cedar root disease.

None of the RNAs are open to off-road or off-trail vehicle use under any alternative. No change is proposed from the current designated motorized or non-motorized designation of these trails except as follows: Under Alternatives 1, 2, and 3, motorized use of the Boundary Trail where it passes through the west end of the Oliver Matthews RNA would be authorized and would continue. Unauthorized off-trail motorized entry and potential resource damage would be less likely to occur under Alternative 4 since motorized use would not be allowed in this area. Note however that no resource damage from OHV use has occurred at this location to date.

d. Cumulative Effects

Botanical Areas and/or special botanical habitats such as serpentine terrain, meadows, fens, and bogs are not likely to have been adversely impacted from major ground-disturbing actions in the past, nor are any major actions anticipated or identified in the future.

The Action Alternatives for this project are expected to maintain or reduce effects from motorized use. Alternatives 3 and 4 would include a reduction in miles of routes open for public wheeled motor vehicle use adjacent to habitat and the prohibition of cross-country travel. Therefore at the scale of these special areas (site-scale), there would be no additional or foreseeable risk from adverse cumulative effects.

3. Public Safety

Will motorized vehicle use on the Rogue River-Siskiyou National Forest create use conflicts or affect public safety?

This issue concerns the safe use of Forest roads and trails by the recreating public. Public safety is a high priority on the RRSNF.

a. Background and Analysis Framework

Public safety on Forest roads and trails is achieved by three basic means: maintaining facilities in good condition, managing the mixture of user types on the same facility and expecting reasonable user behavior.

Facility condition is an aggregation of design, construction and maintenance of a transportation facility. Design and construction dictate the geometric parameters of the facility; the sharpness of the curves, the travel surface widths, the surface type, the climbing and descending gradients, the stopping site distances, signing needs, etc. Maintenance of drainage, surfacing, vegetation, signing is an attempt to preserve the original design and construction standards of the facility.

Mixed use on the same facility can create safety conflicts. Some motorized and non-motorized examples include:

1) *Mountain bikes on stock trails:* Mountain bikes on a downhill run tend to be fairly quiet and move at a high rate of speed which can surprise and spook stock into unsafe behaviors.

2) *Unlicensed OHV riders on roads:* OHVs often travel roads at a higher rate of speed than highway vehicles. When the OHV user is unlicensed and/or inexperienced, meeting on-coming traffic is hazardous and can be disastrous. Vehicle accidents on this Forest involving OHVs have been low. Law enforcement personnel have had very few problems with OHV riders on roads and trails and citations issued to OHV operators are no greater than those issued to licensed vehicle operators (Ross, personal communication)

3) *Freeride mountain bikes on trails:* Freeride is a relatively new discipline of mountain biking, combining different aspects of the sport such as downhill and dirtjumping which has progressed rapidly in recent years, and is now recognized as one of the most popular disciplines within mountain biking. The original concept of freeriding was that there was no set course, goals or rules to abide by. The result, within a small portion of the freeride community, is that irresponsible riders attain very high speeds in areas with short sight distances and are a threat to hikers, runners, and their dogs. On the RRSNF, this hazard is most acute on the highly-used trails within the Ashland Watershed.

4) *Motorcycles on trails:* Motorcycles can attain high rates of speed on both downhill and uphill sections of a trail. This can pose a hazard to hikers, equestrians, and mountain bikers if sight distance is limited. However, unlike mountain bikes, motorcycles are not silent and other users can generally hear an approaching motorcyclist. Also, many portions of single track trails used by motorcyclists are not conducive to high speed due to steep and rocky terrain.

User expectation and behavior can be characterized by the reasonable and responsible use of Forest roads and trails. Reasonable users will assess the type and condition of road or trail and modify their driving or traveling techniques accordingly.

Expectations and behavior may vary based on the type of facility. Passenger car roads (Maintenance Level 3, 4, and 5) are identified on the Forest visitor maps as paved, graveled, or improved roads and are typically roads that have been designed and constructed to carry commercial truck and recreational highway vehicles. Safe and reasonable users should expect conditions including: slow to moderate driving speeds, low to high traffic volumes, a variety of road surfaces, routinely maintained road surfaces, and navigational signing.

Roads not suitable for passenger car use (Maintenance Level 2) are displayed on the Forest visitor maps as unimproved roads and can be characterized as narrow single-lane, native surfaced roads with few passing turnouts, minimal direction signing, and minimal surface or vegetation maintenance. Safe and reasonable users should expect conditions including: very slow-speed driving and minimal sight distance, native road surfaces, narrow, rough, and high-clearance road surfaces, steeper road gradients and tight curves, low to moderate traffic volume, and navigating using maps without a lot of signing aids.

Motorized trails offer a variety of standards and challenges. Safe and reasonable users should expect conditions including: varying widths, gradients, surface types and challenges, obstacles like downed logs or protruding rocks and roots, one-lane trails where passing is a challenge, encountering a variety of other types of users and sharing the trail, and stopping and turning around when the challenge of the trail exceeds their ability.

Although there are many examples of non-motorized mixed use (as described above), this analysis focuses on motorized mixed use, particularly on roads.

Under Oregon State Law, paved roads and two-lane gravel roads are closed to non-highway legal vehicles unless posted open and gravel roads that are one and one-half lanes or less are open to OHVs unless posted closed (Oregon OHV Laws and Rules Handbook 2008).

The designation of a road for mixed-use may preempt State law (by allowing motorized mixed use where it would otherwise be prohibited) but may do so only after consideration of safety, liability, and enforcement issues, and only after coordination with State and local governmental and law enforcement agencies. Analysis of mixed use is guided by Forest Service Handbook 7709.55, Chapter 30 (effective January 8, 2009). Though not completed for this DEIS, an analysis of all routes where mixed use would occur, including paved roads will be completed prior to making a decision regarding mixed use.

b. Direct and Indirect Effects

Identification of motorized routes would not change the Forest's public safety priority under any of the alternatives. The effects to user safety are similar for all alternatives. Three factors influence the safety of the road and trail system: the condition of the facilities, the mixture of uses on a particular facility (mixed use) and user behavior. Safety is enhanced if Forest roads and trails are routinely maintained and unexpected damage or unsafe conditions are identified and corrected in a reasonable amount of time. Regardless of the final decision, public safety issues would be addressed as identified.

Facility Condition

All alternatives provide for user safety. It is expected that, as part of the forthcoming decision, the Forest would continue to maintain a program of inspecting the transportation system on a regular basis and identifying safety issues needing correction. It is also expected that the Forest would continue to fund and maintain any transportation system in order to correct safety issues in a reasonable amount of time.

Motorized Mixed Use

Under all alternatives it is expected that safety in general would increase due to Oregon's new OHV safety laws that are being phased in at the current time. These new laws require youth supervision and safety education for all riders. See Chapter II; section B, 4 for a more detailed discussion of the new requirements.

Under **Alternative 1 (No Action)** unauthorized mixed use would continue to occur on paved roads and on non-paved roads greater than one and a half lanes. This use would increase through time due to expected population growth.

User guides and signing would be planned under all of the **Action Alternatives** to educate users about mixed use on roads and trails. In combination with Oregon's new safety laws it is expected that overall safety will increase on the Forest's roads and trails.

In **Alternative 2**, traffic density would remain the same as Alternative 1. Traffic density on open roads would increase slightly in **Alternatives 3 and 4** due to closure of some roads, but this change would not likely be noticeable to the public and would not have a measurable increase in risk to because the proposed road closures are less than one percent of currently open roads. Though unauthorized mixed use currently occurs on many paved roads on the Forest, the prohibition of mixed use on paved roads under Alternatives 2 and 4 would improve public safety.

Effects would be similar on trails as for roads except that a greater amount of trails would be closed to motorized use in Alternative 4 than in Alternative 3. This may result in increased use on those motorized trails that remain open, thereby decreasing safety on those trails.

User Expectation and Behavior

Safety would be achieved under all alternatives if users act reasonably and responsibly on Forest roads and trails. Reasonable behavior by users any road or trail significantly improves the overall safety of the transportation system. The potential effects on public safety do not vary substantially by the route Action Alternatives. The safety of the road and trail system is more influenced by the condition of the facilities and user behavior.

c. Cumulative Effects

This project is analyzing motorized use on the entire Forest. As a human social issue, there are not likely to be any predictable effects for motorized use other than those being considered. Past conditions are reflected in the current condition. There are no conditions that could be reasonably foreseen that would cumulative add to the conditions being proposed and analyzed that would create a cumulatively adverse effect.

Activities described under all of the Action Alternatives would not increase threats to public safety because the RRSNF would follow State law and an engineering analysis of mixed use will be completed. Though the volume of traffic may increase slightly in the foreseeable future, the change in composition of the traffic, and the distribution of these vehicles is not expected to be noticeable. The majority of NFS roads on the RRSNF are designed for low speeds and have low traffic levels. The implementation under any of the Action Alternatives is not anticipated to increase to levels that would cumulatively affect public safety.

4. Motorized Opportunities

Will proposed actions create a lack of motorized recreation opportunities, especially loops, connecting routes, and destinations, or create a loss of current opportunities?

The existing motorized system provides motorized access and recreation driving opportunities to most areas of the Forest. Motorized recreation activities include driving for pleasure and providing access to recreational activities. Off-highway vehicles are also used to access many activities in remote areas on rough roads or trails that could not be accessed by regular passenger vehicles. This issue considers the change in motorized opportunities over current conditions.

a. Background

The Rogue River-Siskiyou National Forest is located in Southwest Oregon and far Northwest California. The Forest is less than an hour drive from most location in Jackson, Josephine, Curry, and Coos counties. The Forest offers high mountain scenery, attractive reservoirs and lakes, beautiful river canyons, and a wide range of campgrounds and trails for forest visitors.

In 2005, the Forest developed a recreation niche statement “Cascades to the Coast.” The niche provides the vision of what the Forest is most capable of providing in the form of recreation settings and experiences. To establish niche, the Forest identified its unique attributes (both physical and social), special places, and potential experiences. To determine what outdoor recreation experiences people desire and expect, Forest managers focused on community connections and user satisfaction to help understand public preferences.

Some of the unique attributes within this niche are:

- The Cascade, Siskiyou, and Coastal Mountain Ranges converge in SW Oregon and are the backbone of the special setting for the Forest.
- The rivers flowing from these mountains are valued for their clean water, outstanding fisheries and recreational boating. Waterfalls and rock palisades accent the rivers and streams.
- Botanical species, including ice-age plants and large trees, are the most diverse in the western U.S.
- Climatic diversity allows year-round recreation and escape from the valley heat and coastal fog.
- The largest expanse of Wilderness and roadless areas in the Pacific Northwest region provides solitude seldom found on the west side of Interstate 5.
- Mt. Ashland and Mt. McLoughlin provide a snow-capped scenic backdrop to the valley communities.
- The Forest provides a "refuge" quality of life for local residents and, by contrast, enriches the experiences of visitors drawn to the area by the art and culture of valley communities.

Four niche setting descriptions were created from the niche development process:

- River Corridors - This setting includes the largest concentration of designated Wild and Scenic Rivers on the Pacific Coast; Rogue, Illinois, Chetco, Elk, and North Fork Smith. Scenic Byways parallel segments of the Rogue, South Fork Coquille and North Fork Smith Rivers. Other rivers are also included in this setting. High quality fish habitat draws international visitation.
- Concentrated Use Nodes - are associated with rivers, lakes, or winter sports.
- Rugged Remote - Offers solitude in a wild and primitive setting. Includes the highest elevations and rugged back country as well as the unique botanical diversity.
- Roaded Forest - Lower elevation, mixed conifer forest, accessed by roads from easy to difficult. Includes many trailheads and access points to back country. (USDA- 2006)

These attractive recreation opportunities result in high visitation levels. Based on the National Visitor Use Monitoring Results, the Forest received an estimated 1, 406,000 visits in 2002 (National Visitor Use Monitoring Results, Nov. 2008). A visit is defined as the entry of one person upon a national forest to participate in recreation activities for an unspecified period of time. A visit could be one hour or several days.

Based on this survey, approximately 70% of Forest visitors live within 75 miles, 22% within 200 miles, and the remaining 8% more than 200 miles. As can be expected, the variety of activities are broad and include camping, backpacking, viewing scenery, fishing, hunting, skiing, driving for pleasure, nature viewing, bicycling, OHV riding, and a number of other activities.

Most access to the Forest requires motor vehicle travel (an exception being the community of Ashland, which borders the Forest and where a network of non-motorized trails provides access to NFS Lands).

b. Effects Mechanisms and Analysis Framework

This analysis will focus on motorized use on the Forest's roads and trails and the changes associated with the alternatives. It is acknowledged that Forest visitors take part in many recreational activities so there is a great amount of overlap of activities. For example, some people will use a four wheel drive vehicle to access dispersed camping sites and to go fishing while others may travel to a developed campground with a passenger vehicle to hike or explore the Forest on a motorcycle or mountain bike.

The existing Forest Service road system provides motorized access and recreation driving opportunities to most areas of the Forest. Motorized recreation activities include driving for pleasure and providing access to hiking and walking, fishing, bicycling, skiing, viewing natural features, hunting, boating, developed and primitive camping, picnicking, viewing wildlife, backpacking, resort use, visiting historic sites, nature study, gathering forest products, horseback riding, and interpretive site activities. Many 4WD vehicles that are capable of OHV use never get off of Forest System roads and the driver uses them as passenger vehicles or high clearance vehicles but never actually needs to put the vehicle into 4WD mode.

On the other hand, off-highway vehicles are also used to access many of the above activities in remote areas on rough roads that could not be accessed by regular passenger vehicles. Based on the National Visitor Use Monitoring Results for the Forest, one can infer that about two thirds of Forest visits are at least partly tied to general motorized recreation to the extent that they use motor vehicles to access all the recreation opportunities described above including non-motorized activities. The survey also shows that approximately 5% of visitors indicated that driving for pleasure was their primary activity.

Approximately 4,590 miles of National Forest Transportation System (NFTS) roads are open to the public and provide access for all of the above recreation activities. Most roads above 4,000 feet in elevation are closed to wheeled motorized use during the winter months due to snow.² Mixed use is allowed on approximately 3,480 miles (76%) of the existing 4,590-mile road system.

Approximately 1,194 miles of trail are located on the Forest. Motorized use is allowed on 253 miles while non-motorized users have access to the entire system. Motorized trails are located on all Ranger Districts and provide opportunities for Class I (quads), Class II (jeeps), and Class III (motorcycles) vehicles.

The Prospect OHV System on the north end of the High Cascades Ranger District provides opportunities for all three vehicle classes. The Prospect System is very popular for OHV enthusiasts.

² Many of these higher elevation roads are designated snowmobile trails, particularly on the High Cascades Ranger District. This analysis focuses solely on wheeled vehicles and does not include snowmobiles or other tracked vehicles. Most designated snowmobile trails on the Forest prohibit wheeled motorized use.

The system is closed from December 1 through June 30 for the protection of Big Game (deer and elk) Winter Range habitat. Most other motorized trails on the Forest are single track³ and suitable for motorcycles only. Popular routes include the Mule Mountain/Elliot Ridge complex on the Siskiyou Mountains Ranger District, the Boundary Trail and connectors on the Siskiyou Mountains and Wild Rivers Ranger Districts, and a complex of trails in the Briggs Valley area on Wild Rivers. The nationally known “McGrew “Trail,” located at the south end of the Wild Rivers Ranger District, is actually a road. It is an extremely rough, narrow and rocky road that requires a minimum of 6 hours to drive by highly experienced operators.

Unauthorized cross-country travel occurs on the Forest. This use continues since it is not prohibited by a specific Forest Order⁴. According to LRMP direction, approximately 275,000 acres are open to OHV cross-country travel. However, many of these acres are not actually available due to steep terrain and dense vegetation. Most unauthorized cross-country travel occurs in open areas (sparse vegetation) on the Forest such as the Siskiyou Crest on the Siskiyou Mountains RD and the serpentine soil areas on the Wild Rivers RD. Unauthorized user-created trails are often a result of this cross-country travel. Mileage figures for user-created motorized trails on the Forest are unknown, although most are located on the Wild Rivers Ranger District.

OHV use is widely recognized as one of the fastest growing recreation activities in the United States. The total number of Class I and Class III vehicles increased from an estimated 2.9 million in 1993 to 8.0 million in 2003. Off-highway motorcycles account for approximately 30% of the total (2.4 million). Growth in OHV driving showed a 32% increase from 1994 to 1999 (27.3 million to 36.0 million). An estimated 18.6 % of the U.S. population age 16 and older participated in some form of OHV recreation from 1999-2004. The Pacific region⁵ rate was nearly identical at 18.4% while Oregon’s rate was 22.0% (Cordell et. al.2005). An estimated 2% (28,000) of Rogue River-Siskiyou NF visitors participated in OHV use each year between 2002 and 2007 (USDA Forest Service 2008a).

c. Direct and Indirect Effects of Alternatives

For environmental consequences the alternatives are compared in general for all motorized recreation opportunities and then where appropriate, specific opportunities or areas are compared by alternative. The alternatives are listed in order. Note that consequences associated with use conflict were discussed in the previous section as a separate issue.

Alternative 1 and 2

Current motorized recreation opportunities under **Alternative 1** would continue on the Forest and no roads or trails would be closed or constructed on the Forest unless future site-specific NEPA analysis were to be conducted.

³ “Single track” refers to a trail that is sized for hikers, equestrians, bicycles, and motorcycles. Tread width is not sufficiently wide for use by quads or jeeps with a trail so narrow that users must generally travel in single file.

⁴ Forest Supervisors may issue orders which close or restrict use of a described area(s) within the area over which they have jurisdiction. An order may close an area to entry or may restrict the use of an area.

⁵ The Pacific region includes the following states: Alaska, California, Hawaii, Oregon, and Washington.

Cross-country travel would continue to occur and most likely increase with a growing local population. There would be no loss or gain of current motorized opportunities for loops, connecting routes, and destinations on motorized trails and roads.

Consequences for **Alternative 2** would be nearly identical to Alternative 1 but would differ in two respects. First, a Forest Plan Amendment would provide consistency between the Rogue River LRMP and the Siskiyou LRMP in the Boundary Trail area. It is important to note that LRMPs provide “guidelines” for how an area is managed. A Forest Order is required to enforce those guidelines. Second, enactment of the Travel Management Rule (via a Forest-wide Plan Amendment) would require publication of a MVUM that would clearly show where motorized use is allowed. Current District and Forest maps do not distinguish between motorized and non-motorized roads, trails, and areas. Both of these changes would make it easier for the public to more clearly understand where motorized use is allowed.

Alternative 3

This alternative attempts to balance motorized recreation with other public land uses, such as hiking, horseback riding, mountain biking, hunting, fishing and camping. In some cases motorized opportunities are increased, while in others those opportunities are decreased.

Cross-country travel would be prohibited across the Forest, thereby eliminating a recreation pursuit that is important to a segment of the OHV community. It is difficult to measure or predict, but this off-road prohibition may cause some users to travel to other forests, BLM lands, or private property in order to pursue cross-country travel opportunities.

Most roads that are currently open to the public would remain open. There would be a very slight loss (less than 1/10 of 1%) of current motorized opportunities for loops, connecting routes, and destinations on Forest roads.

The current motorized 253-mile trail system would overall be reduced by 10 miles, including 2 miles of new construction and 23 miles of conversion of roads to motorized trails. Some loops and destinations would be lost while others would be gained (see the District-specific analysis below).

Powers Ranger District

Designated mixed use on the paved Eden Valley Road (#3348) would provide loop and destination opportunities in this area, particularly during elk season when hunters use Class I vehicles.

Motorized use prohibitions in the proposed 13,700-acre Copper Salmon Wilderness Area would limit motorized access to the uppermost portions of North and South Forks of the Elk River and the upper Middle Fork of Sixes River. However, none of the road closures provided loop or connecting opportunities as all of the roads are relatively short dead-end spurs. Motorized closure of the lightly-used Barklow Mountain Trail (# 1258 and 1258.1) would prohibit a motorized loop opportunity with the 3353 Road.

Gold Beach Ranger District

No road use would be prohibited on the District. Approximately 12.6 miles of the 1376 road system just north of the Chetco River on the west edge of the District would be closed to mixed use. This would limit the potential of OHVs to illegally cross onto private lands in this area. Loop opportunities and connecting routes do not currently exist on this 12-mile road system, so effects to OHV riders would be minimal, especially when all other District mixed use roads would remain open.

Approximately 23 miles of Maintenance Level 1 roads would be converted to motorized trails. These conversions would provide more recreation opportunities for OHV riders in the following areas: Lawson and Quosatana Creeks, Game Lake, and Signal Butte. All of the conversions, with the exception of the Lawson Creek Road (3318310), provide for expanded loop opportunities because of their connection with other roads. The Lawson Creek conversion would be an “out and back” trail, but its length provides for a relatively remote experience away from roads and standard passenger vehicles.

The proposed 0.5 miles of trail construction would connect the Woodruff Trail (#1164) to the 3313110 Road that is being converted to a motorized trail. It is acknowledge that this “new” trail construction occurs on a user-created trail that already receives use by quad and motorcycle riders. This alternative would authorize that use and bring the trail up to standard in order to minimize resource impacts and provide for user safety. This authorization would provide a loop opportunity for motorized users.

Approximately 11 miles of the lower portions of the Game Lake (# 1169) and Lawson Creek (#1173) Trails would be closed to motorized use. As stated in Chapter II, both of these trails are impassable for motorized users due to steep slopes and overgrown vegetation. Formal closure of these single-track sections of trail under the Travel Management Rule is more of a “bookkeeping” change than an actual motorized use closure. There would be no effect to motorized use because these trail segments are not currently used.

Wild Rivers Ranger District

Approximately 13.1 miles of portions of the 4300 and 4400 road systems would be closed to motorized use. These road systems currently provide a challenge to experienced OHV operators in the Rock Creek, Josephine Creek, and Canyon Creek areas southwest and northwest of Cave Junction. They are generally rough, rocky, and steep. They provide loop opportunities and connecting routes for all three OHV vehicle classes and are popular destinations for Illinois and Rogue Valley residents. From a motorized user’s point of view, prohibiting motorized use on these two primitive road systems would eliminate a highly-valued OHV opportunity.

An additional 11.8 miles on the 4300 and 4201 road systems in the Canyon Creek/Josephine Creek/Fiddler Gulch areas would be closed to mixed use, so this would also contribute to a loss of opportunity for OHV riders.

Approximately 3.3 miles of the 4201016 and 4103011 road systems would also prohibit motorized use. These roads are located slightly north of the Canyon Creek and Josephine Creek areas discussed in the previous paragraph. The roads parallel the Illinois River west of Eight Dollar Mountain and serve as a connecting route between the 4201 and 4103 Roads. Closure of this road would eliminate motorized dispersed camping and picnicking opportunities along this stretch of the Illinois River. It would also eliminate a short loop opportunity from Highway 199 between the Eight Dollar Road (4201) and the Illinois River Road (4103).

One other short segment of road would also prohibit motorized use. Approximately 0.6 miles of the 2600050 Road near Silver Creek would be closed due to issues associated with private land near its terminus. This closure would have minimal effect on motorized opportunities as most of the road would remain open and the motorized Dutchy Creek Trail (#1146) would still be accessible.

Approximately 3 miles of two road segments would be converted to motorized trails. Conversion of the 4402494 Road would provide access to Biscuit Hill from the popular McGrew Trail on the south end of the District while conversion 2509640 would provide a connector to the existing Shan Creek Trail. Both would enhance the recreation experience for motorized users.

Approximately 17.2 miles of trail would prohibit motorized use where it is currently allowed. The single-track Mt Elijah (#1206) and Bigelow Lake (#1214) Trails provide access to the Boundary Trail and serve as a connection between the Illinois River and Applegate River drainages.

Closure of these two trails would require motorcyclists to use the much steeper and technical Elk Creek Trail (#1230) to the north in order to have a connection between the two watersheds. In addition, riders would not have motorized access to the alpine scenery surrounding Bigelow Lake. Bolan Lake (#1245) and Kings Saddle (#1245A), located near the California border, also provide single track motorized access to alpine scenery and vistas and this opportunity would be lost.

Motorized use would be prohibited on a complex of trails located in and around Briggs Valley: a portion of Taylor Creek (#1142), Big Pine Spur (#1142A), Onion Way (#1181), Secret Way (#1182), and Secret Way Spur (#1182A). This would eliminate a number of loop opportunities and connecting routes in this area although some remain to the north (lower Taylor Creek) and south (Briggs Creek). Motorized prohibition on the 1-mile Swede Creek Trail (#1135), located south of Briggs Valley, would not limit connecting routes or loops since the trail does not connect to other routes. Likewise, the Little Silver Lake Trail (#1184), located in the Silver Creek drainage, is an “out and back” trail and is seldom used by motorcyclists due to steep slopes and exposure to cliffs on a “razor-back” ridge.

Seasonal closure of the McGrew Trail would result in a loss of opportunity for those who use the trail during the “wet months” of mid October through mid May. Sections of the trail are open almost year-round and the highest elevations are generally not snow-covered for more than 2-3 months because the trail is at a relatively low elevation (1,660-3,940 feet). Seasonal closure would limit use, especially in the spring and fall.

Siskiyou Mountains Ranger District

No road use would be prohibited on the District and mixed use would continue on all existing non-paved roads.

Motorized use would be prohibited on 4 miles of the Horse Camp Trail (#958). This trail is an “out and back” trail that terminates on the Pacific Crest National Scenic Trail (PCNST) where motorized use is prohibited. Motorized prohibition would lessen the likelihood of motorcyclists using the PCNST as part of a loop system that would connect with the nearby Cook and Green Trail (#959). Prohibition of motorcycle use on this single track trail would prevent motorized users from accessing the alpine scenery and Echo Lake on the upper portions of the trail.

Approximately 1.2 miles of the Penn Sled Trail (#957) would be reconstructed and partially relocated. The trail has not been maintained for a number of years. This trail would connect two existing single track motorized trail systems (Mule Mountain and Elliot Ridge) that are highly valued by motorcyclists. Relocation of the lower portion of the trail would lessen the likelihood of trespass on private property located along Squaw Creek.

High Cascades Ranger District

No road use would be prohibited on the District and mixed use would continue on all existing roads where it is currently allowed. Mixed use is currently not allowed on roads located on the Prospect/Union Creek portion of the District except for those associated with the 250-mile Prospect OHV system. The only change proposed for roads and trails is to allow mixed use on approximately 31.5 miles of paved road on portions of Roads 34 and 37 (east of Butte Falls) and 3705 and 3720 (south of Fish Lake). Designation of mixed use on these roads would expand loop and destination opportunities in these areas, particularly during the deer and elk seasons when the greatest use occurs.

A new play area, in addition to the existing Woodruff Play Area, would be established in the Willow Lake vicinity. This area (approximately 10 acres) is currently used by OHVs. Formal designation would allow for this use to continue. The area is relatively flat and provides opportunities for beginning OHV riders to increase their skills. It is not a challenging area for experienced riders.

Alternative 4

This alternative would limit motorized use across the Forest relative to the other alternatives. Motorized opportunities would decrease (primarily on trails). Cross-country travel would be prohibited across the Forest, thereby eliminating a recreation pursuit that is important to a segment of the OHV community. It is difficult to measure or predict, but this off-road prohibition may cause some users to travel to other forests, BLM lands, or private property in order to pursue trail and cross-country travel opportunities. Illegal use of non-motorized trails may increase in the short term until the public was fully educated about the motorized restrictions.

Most roads that are currently open to the public would remain open. There would be a 71-mile reduction of open roads out of the Forest total of 4,589 miles. Mixed use would continue to occur on most non-paved roads and would be prohibited on all paved roads except the Prospect OHV system.

This would be a 95 mile reduction out of a total of 3,484 miles where mixed use is currently allowed. There would be a loss (approximately 3%) of current motorized opportunities for loops, connecting routes, and destinations on Forest roads.

The current motorized 253-mile trail system would be reduced by 139 miles (68%) and there would be no new trail construction or conversion of roads to trails. There would be a decrease in motorized opportunities for loops, connecting routes and destinations (see the District-specific analysis below). Five high quality trail systems/complexes would be closed to motorized use: (1) the Boundary Trail and all connecting trails, (2) the majority of the Briggs Valley system, (3) the McGrew Trail, (4) the Mule Mountain system, and (4) the Hobson Horn/Silver Peak Trail to the Illinois River.

Two high quality motorized trail systems would remain open to motorized use: the Prospect OHV network (High Cascades RD) and the Elliot Ridge system (Siskiyou Mountains RD). It is expected that these two systems would receive increased use due to the aforementioned closures on the Boundary, Briggs Valley, McGrew, Mule Mountain, and Hobson Horn/Silver Peak Trail systems.

Powers Ranger District

Motorized use prohibitions would be the same as Alternative 3 with the following additions. Prohibiting mixed use on the paved Eden Valley Road (#3348) would limit loop and destination opportunities in this area, particularly during elk season.

Motorized use would also be prohibited on the 1 mile Big Tree Trail (#1150) south of Powers near the South Fork Coquille River and on the 2.7 mile “Russian Mike” Trail (unnumbered) near Russian Mike Creek on the South Fork Sixes River. Both of these trails are “out and back” so loop opportunities would not be lost. However, the prohibition would not allow motorized access to these two areas.

Gold Beach Ranger District

Motorized use prohibitions would be the same as Alternative 3 with the following additions. Motorized use would also be prohibited on the entire length of the Game Lake (#1169) and Lawson Creek (#1173) trails, the lower portion of the Illinois River Trail (#1161), Lower Rogue River Trail (#1168)⁶, “Nancy Creek” (Unnumbered), the Silver Peak-Hobson Horn Trail (#1166) located on both the Gold Beach and Wild Rivers Ranger Districts, and the Fish Hook Trail (#1180) also located on both Ranger Districts. This represents a decrease of miles available to motorized use on the District. All of these trails provide outstanding opportunities for motorized loops and connections and all provide outstanding views along portions of their routes. These opportunities would not be available for motorized users in this alternative.

Unlike Alternative 3, there would be motorized use prohibitions on approximately 6 miles of road in the Basin Creek, Coon Creek, and East Fork Winchuck River drainages. All of these roads are dead end spurs so loop opportunities on roads would not be lost in this alternative.

Wild Rivers Ranger District

Motorized use prohibitions would be the same as Alternative 3 with the following additions. Motorized use would also be prohibited on Dutchy Creek Trail (#1146) northwest of Road 2402, the Briggs Valley Complex that includes a portion of Briggs Creek (#1132), Red Dog (#1143) and Phone (#1153) trails, and the Silver Peak-Hobson Horn Trail (#1166) located on both the Gold Beach and Wild Rivers Ranger Districts. The Fish Hook Trail (#1180), also located on both Ranger Districts, would also be closed to motorized use.

The entire Boundary complex of trails would be closed to motorized use in this alternative: Boundary (#1207), Elk Creek (#1230), Bigelow Lake (#1214), and Mt. Elijah (#1206), O’Brien Creek (#900), and Sturgis Fork (#903). The latter two trails are located on the Siskiyou Mountains Ranger District and tie into the Boundary Trail.

⁶ There are three “Rogue River” trails on the Forest: the 48-miles Upper Rogue River Trail #1034 on the High Cascades RD; the 42-mile Upper Rogue River Trail # 1160 on the Gold Beach RD and Medford BLM; and the 13-mile Lower Rogue River Trail #1168 on the Gold Beach RD below Agness.

All of these trails provide outstanding opportunities for motorized loops, connections, and destinations and most provide outstanding alpine views along portions of their routes. These opportunities would not be available for motorized users under this alternative.

Under Alternative 4, motorized use of the McGrew Trail would be prohibited. This would result in a loss of opportunity for those who use the trail. There would be an overall decrease of motorized road miles on the District. All of the additional prohibitions in this alternative are on roads located east of Highway 199 in the following areas: Squaw Mountain, Pearsoll Peak, Pockett Knoll, Tennessee Mountain, and the system of roads leading westward from Rough and Ready Creek to the North Fork of the Smith River. The loss of motorized access to a point near Pearsoll Peak would result in users having to access this scenic destination by foot or horse. The closures near Squaw Mountain and Pockett Knoll would be less impactful than the loss of Pearsoll Peak since these destinations are not as important to most users. There would be no loss of loop opportunities in these areas. On the contrary, there would be a loss of highly valued destination and loop opportunities between Rough and Ready Creek and the North Fork of the Smith River, which includes the McGrew Trail.

Siskiyou Mountains Ranger District

Motorized use prohibitions would be the same as Alternative 3 with the following additions. Motorized use would also be prohibited on the 8-mile Cook and Green Trail (#959), the Mule Mountain complex of trails, and on the two connector trails to the Boundary Trail: Sturgis Fork (#903) and O'Brien Creek (#900) (see Boundary Trail discussion above in the Wild Rivers RD section). Closure of the Cook and Green Trail would result in the loss of a popular loop opportunity that incorporates the 1040 and 1055 roads north and west of the trail. Closure of the Mule Mountain system would result in the loss of a high-valued opportunity for motorcyclists in this area as well as limiting the connection to the nearby Elliot Ridge system of trails on and near the California border.

All of these trails provide outstanding opportunities for motorized loops, connections, and destinations and most provide outstanding views along portions of their routes. These opportunities would not be available for motorized users under this alternative.

High Cascades Ranger District

Motorized use prohibitions would be the same as Alternatives 1 and 2. No mixed use would be allowed on paved roads east of Butte Falls (Roads 34 and 37) and south of Fish Lake (Roads 3720 and 3705). This would limit loop and destination opportunities in these areas, particularly during the deer and elk seasons. Although prohibited by State law at the present time, these roads are currently used by OHVs. There would be no additional prohibitions on motorized trails. The Prospect OHV system would remain the same (as it does in all Action Alternatives).

d. Cumulative Effects

At the scale of the Forest, no past, present or reasonably foreseeable future actions were identified with activities or projects would result in cumulative reduction of motorized recreation opportunities, especially loops, connecting routes, and destinations, or create a loss of current opportunities. There is one project on the Forest that may limit road travel on a portion of the Siskiyou Mountains Ranger District. The "Applegate-McKee Bridge Watershed Legacy Roads and Trails Project" is still being developed. Initial indications are that approximately 16.2 miles of road would be decommissioned and 1.6 miles closed while others would be storm-proofed and have stream crossing upgrades.

In addition to the McKee project, there are many miles of currently open roads that have an Objective Maintenance Level 1. If funding becomes available and if this objective does not change, some roads may be closed in the future. At the present time it is not possible to quantify miles of roads that would prohibit motorized use.

Adjacent national forests and BLM districts are also in the early stages of motorized route designation. However, none of the Forests or Districts have formally developed proposed actions. It would be highly speculative to predict what might be contained in those proposals at this time.⁷ One exception is the recently released Timber Mountain Recreation Management Plan DEIS (USDI, BLM 2009). Approximately 31 to 140 miles of roads and trails would be opened to OHVs instead of the 376 miles of roads and trails on public and private land that are currently used.

This reduction in motorized opportunity on BLM lands adjacent to Jacksonville, Oregon, may result in increased motorized use on the RRSNF, especially on the Siskiyou Mountains RD, which is located a short distance south of Jacksonville.

Motorized trail and cross-country closures in Alternative 4 may cause some users to travel to other forests, BLM lands, or private property in order to pursue trail and cross-country travel opportunities.

5. Roadless Character within Inventoried Roadless Areas

Will motorized vehicle use on the Rogue River-Siskiyou National Forest (especially motorized trails) affect roadless character within Inventoried Roadless Areas?

There are 26 Inventoried Roadless Areas (IRAs) within the RRSNF, comprising a total of approximately 368,000 acres, as mapped in the RRSNF Geographic Information System (GIS).

The original inventory of roadless lands took place in the early 1970s during the RARE (Roadless Area Evaluation and Review) I evaluations, and then again in the late 1970s during RARE II. The inventory is displayed in the current Forest Plan EIS and is an output of the RARE II inventory. Complete descriptions of these areas can be found in Appendix C of the FEIS for the Forest Plans (USDA 1989 and USDA 1990).

a. Background

All IRAs, identified in Appendix C of the Land and Resource Management Plans (LRMP), are managed according to the direction provided in the LRMP for their underlying land allocations. Some allocations permit motorized use within an IRA while others limit or prohibit motorized opportunities.

Map III-1 shows the IRAs on the Rogue River-Siskiyou National Forest. Within the RRSNF, there are approximately 48 miles of open roads (Maintenance Level 2) within IRAs identified in Appendix C in the LRMPs. The majority of these roads are within the South Kalmiopsis IRA on the Wild Rivers Ranger District.

⁷ The Smith River National Recreation Area Road Management Route Designation Project Environmental Analysis was completed and a decision signed on September 27, 2007. However, the decision was reversed and a new decision is pending further analysis.

In addition, there are approximately 236 miles of NFS trails within IRAs on the Forest. Of this total, approximately 98 miles allow motorized use. Cross-country (or off-road) travel is currently allowed on approximately 30,170 acres of the area within the IRAs.

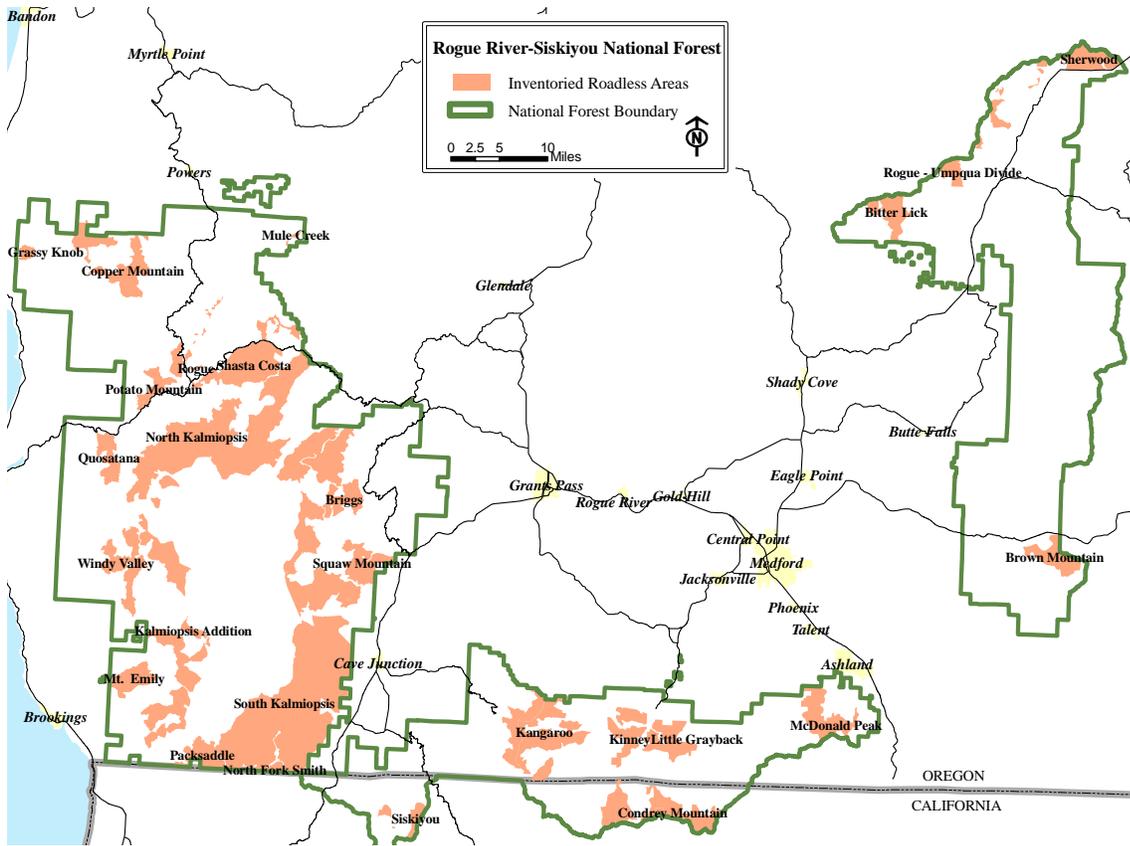
Roadless characteristics include natural resource values or features often present on other, non-roadless, lands but are perhaps more highly valued because of their greater extent or higher quality in IRAs and are thus often used to characterize Inventoried Roadless Areas. The following sections discuss such resource values and features:

High quality or undisturbed soil, water, and air: These three key resources are the foundation upon which other resource values and outputs depend. Healthy watersheds catch, store, and release water over time, protecting downstream communities from flooding; providing clean water for domestic, agricultural, and industrial uses; helping maintain abundant and healthy fish and wildlife populations; and are the basis for many forms of outdoor recreation.

Water quality is discussed in Section C, 1, this Chapter. Soil or site productivity is discussed in Section D, 1 and air quality is discussed in Sections D, 3 and 4, this Chapter.

Sources of public drinking water: National Forest System lands contain several watersheds that are important sources of public drinking water. Roadless areas within the entire National Forest System contain all or portions of 354 municipal watersheds contributing drinking water to millions of citizens. Maintaining these areas in a relatively undisturbed condition saves downstream communities millions of dollars in water filtration costs. Careful management of these watersheds is crucial in maintaining the flow and affordability of clean water to a growing population.

Map III-1. Inventoried Roadless Areas on the Rogue River-Siskiyou NF



Diversity of plant and animal communities: Roadless 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 serving as a buffer against the spread of nonnative invasive species. These effects are discussed in various sections including C, 2; D, 6 and 7; and D, 10 and 11.

Habitat for Threatened, Endangered, Proposed, Candidate, and Sensitive species and for those species dependent on large, undisturbed areas of land: Roadless areas function as biological strongholds and refuges for many species because of their lack of fragmentation and development. Roadless areas support a diversity of aquatic habitats and communities. Threatened, Endangered, and Sensitive species are discussed in Section D, 9, this Chapter

Primitive, Semi-Primitive Non- Motorized, and Semi-Primitive Motorized classes of dispersed recreation: Roadless areas often provide outstanding dispersed 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 mechanized means of travel is often allowed. These areas can also take pressure off heavily used wilderness areas by providing solitude and quiet, and dispersed recreation opportunities. Motorized opportunities are discussed in Section C, 4, this Chapter.

Reference landscapes: The body of knowledge regarding the effects of management activities over long periods of time and on large landscapes is very limited. Reference landscapes of relatively undisturbed areas serve as a barometer to measure the effects of development on other parts of the landscape.

Natural appearing landscapes with high scenic quality: High quality scenery, especially scenery with natural-appearing landscapes, is a primary reason that many people choose to recreate. Visual quality is discussed in Section D, 13, this chapter

Traditional cultural properties and sacred sites: Traditional cultural properties are places, sites, structures, art, or objects that have played an important role in the cultural history of a group. Traditional cultural properties and sacred sites may be eligible for protection under the National Historic Preservation Act. Cultural resources are discussed in Section D, 16, this chapter

Other locally identified unique characteristics: Inventoried roadless areas may offer other locally identified unique characteristics and values. Unique social, cultural, or historical characteristics sometimes depend on the roadless character of the landscape.

b. Effects Mechanisms and Analysis Framework

It is not the purpose of this planning effort to decide whether motorized use within any IRA is appropriate. Those overarching decisions on the allowance of motorized uses within IRAs were made in the LRMPs and are not being revisited here. As discussed above, IRAs will continue to be managed according to the direction provided in the LRMP for their underlying land allocations.

The only exception to this is within the Kangaroo IRA on the Rogue River National Forest where the underlying land use allocations provide motorized trail-use direction inconsistent with that of the adjacent Siskiyou National Forest LRMP. The inconsistency affects use of a trail that weaves between the two. Motorized use of this trail has been ongoing since before each LRMP was signed, and the Proposed Action seeks simply to accommodate existing use and bring consistency to the direction in the LRMPs. In this case, the issue addressed is not the propriety of motorized use within an IRA, but rather the consistency of underlying land use allocations between adjacent Forests to accommodate long-standing use patterns.

Many of the values listed in the prior section may be affected by motorized use of roads and trails within IRAs. Effects on those natural resources are discussed in the site-specific evaluations of environmental effects elsewhere in this chapter and resolved in alternatives or through mitigations on a site-specific, case-by-case, basis. Here, the analysis focuses on effects to roadless character, and social values unique to these areas, such as their use as natural-appearing reference landscapes, and opportunities for solitude.

Generally, foot, horse, and mountain bike travel in Inventoried Roadless Areas is considered compatible with roadless area characteristics. That type of use is therefore not further analyzed in this section. If new or continued motorized trail use is authorized in the selected alternative, a short-term impact on the roadless characteristics of solitude and remoteness is expected. An increase in the number of miles of motorized trail use will generally have an inverse relationship with solitude and remoteness qualities.

c. Direct and Indirect Effects

Under all alternatives, varying levels of motorized use of existing NFS roads and trails within IRAs would continue.

Reference and Natural Appearing Landscapes

Cross-country travel allowed under **Alternatives 1 and 2** would have impacts that may diminish the affected IRAs ability to serve as reference landscapes of relatively undisturbed forests.

Under these alternatives, approximately 30,170 acres would remain available for cross-country travel. However, due to steep topography and heavy vegetation associated with these areas, it is estimated that less than 3% (900 acres) is actually capable of supporting this use. Based on the analysis assumptions, it is not anticipated that this use would measurably change under any of the alternatives.

Due to the elimination of cross country travel and the reduction in the amount of trails open for motorized use, **Alternatives 3 and 4** would reduce the current level of impact and have less effect than Alternatives 1 and 2 concerning the ability of the landscape to serve as a reference for research study or interpretation. The difference is slight, however, since there is little, if any, cross-country travel in most areas to begin with. The physical impact is primarily on the trails where the use is, not across the un-trailed or un-roaded forest affecting its use for reference or study. Eleven trails would be retained (would continue to exist) in all alternatives, the only difference being the amount of motorized use allowed.

Unique Characteristics: Solitude and Remoteness

Cross-country motorized travel under **Alternatives 1 and 2** would maintain the current likelihood of encountering other recreationists, perhaps adversely affecting each user's sense of solitude and distance from the sights, sounds, and evidence of other human use. Under these alternatives, there is expected to be no change to the use levels along those routes currently used. Continued allowance of cross-country travel would not result in permanent improvements such as structures, construction, habitations, and other evidence of modern human presence or occupation, other than the presence of tracks.

Alternative 3, and to a greater extent **Alternative 4**, would result in a lower likelihood of encountering other users along the trails open to motorized use. With the prohibition of cross-country use by these alternatives within the IRAs, there is more opportunity for solitude and to experience less evidence of other human use.

Effects on Suitability for Future Designation as Wilderness

Formally identified IRAs were considered as suitable for Wilderness designation when they were first established in the LRMPS. At that time, the plans noted that roads, timber harvest, or other development in these areas could adversely affect their eligibility for Wilderness consideration. No such proposals are made in any alternative in this action, thus their continued suitability for future inclusion in the National Wilderness Preservation System Wilderness remains unaffected.

Summary

Alternatives 1 and 2 would not change the current condition in relation to the roadless area characteristics discussed above. Alternatives 3 and 4 would help to improve some of these by reducing the miles of motorized trails in roadless areas, and prohibiting cross-country travel.

The following table summarizes the change of motorized use within IRAs.

Table III-1. Summary of Motorized Use in IRAs by Alternative

	Alternative 1	Alternative 2	Alternative 3	Alternative 4
Acres of cross-country travel	30,170	30,170	0	0
Miles of open roads	48	48	34	0
Miles of motorized trails	98	98	76	0

d. Cumulative Effects

The geographic scope of the cumulative effects analysis was limited to the IRAs within the RRSNF since the effects on reference landscapes, solitude, etc., are measured only within individual IRAs. Refer to the assumptions for cumulative effects at the beginning of this Chapter. Larger-scale cumulative effects assessments concerning the appropriate spacing, kind, and amount of areas providing these values were addressed in the LRMPs.

Effects of past road construction and development in roadless areas in the Rogue River-Siskiyou are minimal, and there is no new road or trail construction proposed in roadless areas in any Action Alternative. Since this analysis includes only existing system trails and roads, with no additional construction or allowance for increased use, there would be no additive impact that might contribute to adverse cumulative effects on character.

Since Alternatives 3 and 4 would reduce the amount of motorized use, the overall undeveloped nature of Inventoried Roadless Areas would improve. The expected increase in recreation use within the Forest and Inventoried Roadless Areas would likely have the cumulative effect of further reducing the availability of areas providing characteristics of solitude and remoteness.

D. ENVIRONMENT AND CONSEQUENCES ASSOCIATED WITH OTHER ISSUES

Other Issues (also presented in Chapter I) were used to formulate design elements and/or mitigation measures common to Action Alternatives (as effects are predicted to be minor and/or similar between Action Alternatives), providing nominal comparison of consequences to aid in later decision-making.

1. Soils - Site Productivity

Will motorized vehicle use affect soils or site productivity?

The geographic scope for the assessment of the soil resource conditions and potential effects is the entire Rogue River-Siskiyou National Forest. The Rogue River-Siskiyou National Forest is divided into five districts: the analysis for the soil resource is organized, analyzed, and discussed for each of the districts. This analysis addresses changes in the type, extent, and location of designated areas open to cross-country motor vehicle use and/or limited motorized access, designated roads, and designated motorized trails by alternative. Temporary roads and trails and unauthorized roads and trails are not a part of this analysis.

EIS Appendix D (incorporated by reference) documents more detail on the soil types and characteristics that have been analyzed, organized by Ranger Districts and affected soils.

a. Background

Geology and soils information discussed in this section is summarized from the Soil Resource Inventory for the Siskiyou National Forest (Meyer and Amaranthus 1979) and the Soil Resource Inventory for the Rogue River National Forest (Badura and Jahn 1977), unless otherwise noted.

Klamath Mountains Geologic-Physiographic Province

The Klamath Mountains geologic-physiographic province encompasses the Powers, Gold Beach, Wild Rivers, and Siskiyou Mountains Ranger Districts.

The Klamath Mountains province is made up of rugged, mountainous terrain and narrow canyons generally with 2,000 to 5,000 feet of relief. The mountains along the coast are generally north-south trending; the province also includes the Siskiyou Mountain Range which is generally east-west trending and straddles the Oregon-California border. The mountains within the Klamath province consist predominantly of pre-tertiary sediments and volcanics (about 65 million years old or more), that have been extensively folded, faulted, and intruded by serpentinized masses of ultra-basic and granitoid rocks along fault zones. The complex geologic history of this region also includes major periods of sea floor subduction at the continental border, volcanism, erosion, mass wasting, and uplift.

The geomorphic processes most common in the Klamath Mountains province are fluviation (degradation of the land surface by running water) and mass wasting. Fluviation is most evident on the long, steep, and rugged slopes that dominate the terrain. Mass wasting is naturally widespread and commonly occurs along geologic contacts, fault zones, in highly fractured parent material, and in areas of moisture accumulation and stream channel cutting of toe slopes. Past glaciation is evident in the highest elevations of the Siskiyou Range.

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.

Western Cascades Geologic-Physiographic Province

The Western Cascades geologic-physiographic province includes the western portion of the High Cascades Ranger District.

The mountains of the Western Cascades province are comprised of volcanic sediments and flows associated with the initial buildup of the Cascades during the Tertiary Period. Rock formations typically include beds of volcanic ash (tuff), massive flows of andesite lava, and layers of breccia and agglomerate. Relatively soft rock types are often overlain by more resistant material. Uplift and stream erosion has produced a topography of high relief.

The geomorphic processes most common in the Western Cascades province are fluviation, mass wasting, and glaciation. Stream systems have carved generally steep-walled canyons with rocky escarpments near or at the top of many intervening ridges.

Soils for the most part are of mixed mineralogy. They generally have moderated depths, medium to fine texture, and contain a wide range of rock fragment percentages. Very deep soils occur in association with glacial and glacio-fluvial deposits, colluvial toe slope and mid slope deposits and ancient mass wasted surfaces. Deep clayey soils possessing montmorillonitic mineralogies tend to develop in slump basins of old landslides originating from tuffaceous bedrock materials, and generally have restricted soil drainage.

High Cascades Geologic-Physiographic Province

The High Cascades geologic-physiographic province includes the eastern portion of the High Cascades Ranger District.

The High Cascades province is relatively young, related to volcanism during the Pliocene and Pleistocene Epochs that resulted in numerous flows of basalt and andesitic basalt, as well as deposits of cinder. The explosive collapse of Mount Mazama about 7,000 years ago left a thick blanket of pumice over much of the High Cascades Ranger District.

This province has the character of a broad, upland plateau, with steep relief occurring in the form of prominent volcanoes or glacially-carved canyons. The geomorphic processes most common in the High Cascades province are fluviation, glaciation, and mass wasting, with glaciation being the most dominating process.

Soils are generally of mixed mineralogy, with average soil depths much greater than might be expected in the other provinces on the Forest and with textures generally medium to coarse. Many soils are relatively free of rock, while soils forming in glacially derived materials can contain large amounts of rock fragments.

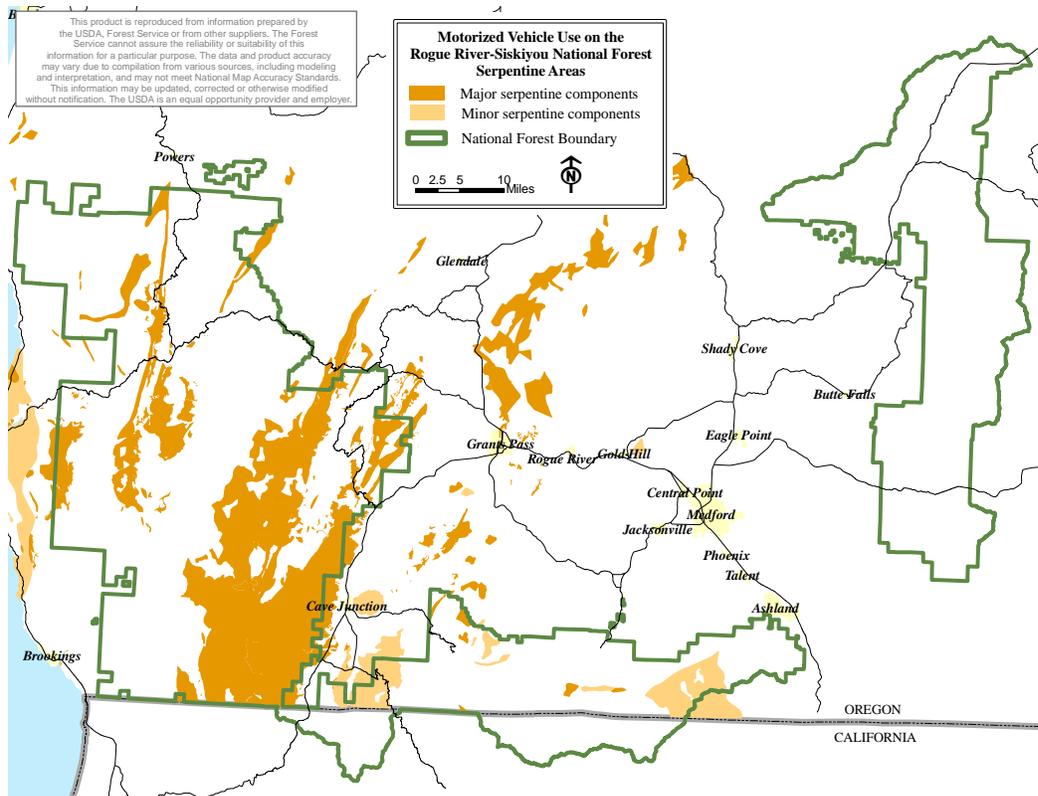
Ashy and cindery soils also occur in association with ash flow deposits on the flanks of former Mount Mazama, and in association with eolian deposits of ash originating from the volcano's eruption. Soil types and arrangements within this province are by far the least complex on the Forest.

Naturally Occurring Asbestos Influenced Soils

Asbestos minerals fall into two general categories – chrysotile and amphibole. Chrysotile and two amphibole minerals, tremolite and anthophyllite, are found in Oregon, and are associated with serpentine (Bright and Ramp, 1965). The Klamath Mountains Province of the Rogue River-Siskiyou National Forest contains intrusions of serpentine along faults and geologic contacts, as well as peridotite that has been exposed through tectonic uplift and altered to serpentine minerals (See Map III-2 for approximate location of serpentine soil areas).

A major block of serpentine extends roughly from Eight Dollar Mountain on the Wild Rivers District, south through Rough and Ready Creek to the California border, west to the north fork of the Smith River, and north extending into the Kalmiopsis Wilderness on the Gold Beach and Wild Rivers Districts.

Map III-2. Serpentine Soil Areas - RRSNF



Bands also extend north into the Limpy Creek, Shan Creek, and Chrome ridge areas. A large block of serpentine is also found on the west side of the Klamath Mountains in the Iron Mountain area of the Powers and Gold Beach Ranger Districts, extending south in a band on the Gold Beach Ranger District. There are smaller areas of serpentine scattered throughout the Powers, Gold Beach, Wild Rivers, and Siskiyou Mountains Ranger Districts.

For a discussion on the potential for human effects from asbestiform, or fibrous asbestos from dust and disturbance to serpentine soils, see Other Issue #4, this Chapter.

b. Effect Mechanisms and Analysis Framework

See the assumption section at the beginning of Chapter III for a general list of assumptions. The following list is specific to soil resources.

- The decision to allow or prohibit the use of public wheeled motor vehicle on routes would have no direct effects on soils. However, a route designation decision does have the potential to affect soils indirectly to the extent that it affects the concentration of use on roads and trails, the levels of maintenance needed, and the potential for damaged areas to recover. The magnitude of the indirect effects on soils will depend on (1) how effectively law enforcement can confine traffic to designated routes; (2) how effectively law enforcement can keep traffic off routes that are not designated; and (3) how well routes closed to public wheeled motor vehicle use recover on their own, without restoration treatments.
- To the extent that wheeled motor vehicle traffic is the primary cause of erosion, prohibiting public wheeled motor vehicle use of existing routes will result in less erosion. In most situations, however, erosion is the result of a combination of factors that include poor route design or location, lack of drainage, and inadequate maintenance.
- The routes being evaluated, as described in the description of the current condition (Alternative 1, No Action), 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 and gully erosion, or restoring the routes to a productive state.

Soil Productivity

Soil productivity on the Rogue River-Siskiyou National Forest has been directly impacted by the type, extent, and location of designated roads, motorized trails, and cross-country motor vehicle use. These impacts have affected the existing condition of all districts to varying degrees.

Soil productivity includes the inherent capacity of a soil under management to support the growth of specified plants, plant communities, or a sequence of plant communities.

The following text describes loss or degradation of soil productivity in two aspects:

- **Total Soil Resource Commitment (TSRC)** is defined as the conversion of a productive site to an essentially non-productive site for a period of more than 50 years. In this analysis, quantifiable TSRC is associated with roads and trails. These areas are dedicated to a specific management use that precludes other uses of the land and removes the majority of the productive capability of the land. These TSRC types of disturbances also affect water quality because they often create the greatest amount of accelerated soil erosion and thus sedimentation.
- **Detrimental Soil Disturbance (DD)** is the alteration of natural soil characteristics that results in immediate or prolonged loss of soil productivity and soil-hydrologic conditions. DD can result from off-road motorized activities and can produce unacceptable levels of soil degradation by compacting, moving, eroding, or puddling the soil. Motorized vehicles can damage soils directly from impact from surface traffic and indirectly by hydrologic modifications, soil transport, and deposition.

Motorized vehicle use off-roads and trails can degrade soil productivity. Direct mechanical impacts have several components: abrasion, compaction, shearing, and displacement.

Compaction reduces soil voids and causes surface subsidence. Shearing is the destructive transfer of force through the soil. Displacement results in the mechanical movement of soil particles. Indirect impacts include hydraulic modification, such as the disruption of surface water flow, reduction in infiltration and percolation, surface ponding, and the loss of water-holding capacity.

Disturbances from roads and motorized trails can increase erosion and sediment delivery. Existing roads and trails are a primary source of long-term management-related sediment. The type, extent, and location of a designated motorized system of roads, trails, and areas contributes to the amount of accelerated erosion, and can vary widely across the landscape (Gucinski et al. 2001). Accelerated erosion and sediment delivery have been identified as a source of water quality pollution in many Rogue River-Siskiyou National Forest watersheds. Reduced soil productivity, manifested through a decline in tree growth, adjacent to roads and trails can also be expected due to changes in soil physical properties along the cut and fill slopes, as well as on road prisms that have been closed but not decommissioned (Gucinski et al. 2001).

The following text provides a summary of how and why each Soil Indicator is used to evaluate effects on the soil resource.

Soil Indicator 1: Acres of the forest designated open to cross-country motor vehicle use

The area designated open to cross-country motor vehicle use is used as a general measure of potential effects to soil productivity. Motorized cross-country travel can pioneer new trails across alpine areas, wetlands, steep slopes, and other areas with sensitive soils, such as serpentine. Degraded areas become a major environmental problem because of their direct effects on vegetation, soils, and site hydrology.

Soil Indicator 2: Miles of road surface

Roads represent a long-term commitment of the soil to a non-productive condition. This is a total resource commitment of the soil resource.

Soil Indicator 3: Miles of designated motorized trails

OHV trails can have similar effects to soil productivity as roads but the effects differ based on the width of the travel way. As with two-wheel motorized trails, OHV trails create additional problems due to steep grades, lack of designed stream crossings, and difficulty of maintaining water management features.

Table III-2 shows the current condition of soil productivity across the forest as related to the forest-wide soil indicators discussed above. This shows the amount of Total Soil Resource Commitment (TSRC) across the forest related to roads and trails, and is an indicator of the Detrimental Disturbance associated with roads, trails, and cross-country motor vehicle use.

Table III-2. Existing Condition of Soil Indicators – Rogue River-Siskiyou NF

Forest-Wide Soil Indicators	Existing Condition
Acres of forest designated open to cross-country motor vehicle use	275,000 acres
Miles of road surface	5,914 miles
Miles of motorized trails	253 miles

c. Direct and Indirect Effects of Alternatives

Under the **No Action Alternative**, the current motorized route system would remain on the landscape and vehicle use designations would not change. Therefore, current effects to the soil resource, including TSRC and current levels of DD would persist. These effects are described in general terms in the current condition discussion.

Alternative 2 would enact the Travel Management Rule with no change to the NFS of roads, trails and areas. Therefore, effects to the soil resource with implementation of this alternative would be the same as for Alternative 1.

Alternative 2 would limit off-road parking for dispersed camping and day use to generally 300 feet from the centerline of all open roads except where specifically prohibited. Typically the greatest effects to soils and site productivity (i.e., loss of vegetation and surface litter, compaction) occur at the initial stage of campsite development, with effects stabilizing over time with continued use, and generally recovering at a slower rate than the initial disturbance rate once no longer used (Marion and Cole 1996).

Limiting off-road access for dispersed camping and day use has the potential to reduce or prevent localized DD from dispersed sites and associated access spurs that are beyond this distance, and would maintain localized DD in sites and on access spurs within this distance. In general the effects of this action across the forest on the soil resource would be negligible, since effects are highly localized. Sites within 300 feet of open roads are predominantly already established and would not experience much change to site productivity.

Under **Alternative 3 (Proposed Action), and Alternative 4**, the miles of road surface would essentially remain the same as the current condition. While there are actions proposed to close roads to motorized use, the road beds would still be retained (i.e., not recontoured/decommissioned and reclaimed for soil site productivity); therefore they would still have some effect of TSRC across the landscape.

Alternative 3 would eliminate cross-country travel across the forest, except for two designated OHV “play” areas. This action would reduce the amount of disturbance to soils across the forest from pioneered routes, and would be a beneficial effect in reducing the occurrence of DD, and reducing the potential for expanding TSRC, as pioneered cross-country routes would otherwise become established with loss to soil site productivity.

In Alternative 4, the miles of motorized trails would be reduced by 139 miles. Motorized trails typically do not receive the same level of maintenance as a road, therefore they often experience higher levels of channelized flows and erosion off their surfaces, as well as a higher chance of surface failure (such as the formation of puddling and deep muck holes) (Meyer 2002). This would result in a beneficial effect across the Forest to DD related to these kinds of soil disturbances.

Alternative 3 would limit off-road parking for dispersed camping and day use to generally 300 feet from the centerline of designated roads. Effects would be similar to Alternative 2, except that there would be a greater reduction in roads open to this dispersed use. Therefore, more dispersed camping and day use sites, and associated access spurs, would have the opportunity to recover naturally from DD associated with those impacts.

The following discussion presents effects by specific Ranger Districts, with a focus on the action element as associated with the Proposed Action and Alternative 4.

Powers Ranger District

This action proposed under Alternative 3 and 4 would result in no change to the TSRC since the trail would still exist as a commitment to the soil resource. There would be no change, to a potential reduction in DD with the exclusion of motorized use disturbance. Exclusion of motorized use may allow surface litter and vegetation to encroach and narrow the active trail tread, which has the potential to reduce soil displacement. DD impacts would be reduced in soils #52G and #180F that are derived from serpentinitic parent material. This action would have the potential to reduce DD impacts on soils with severe erosion rating by 1.7 miles. Under Alternative 4, an additional 2.7 miles of trail would be closed to motorized use.

This action under Alternative 3 would result in no change to the TSRC or in DD. The proposed activity would merely redefine the type of vehicle that is permitted to drive on Forest Road 3348.

Gold Beach Ranger District

This action under Alternative 3 would result in no change to the TSRC since the road beds would still be committed to travel routes. There would be an increase in DD since the travel bed would be going from a closed state, where organic litter and vegetation have the opportunity to collect and grow on the road surface, to an actively used state that would result in regular “fluffing” of the travel-bed surface from wheel action that is easily susceptible to soil displacement. Some of these routes travel over areas with serpentine soils. Approximately 1.78 miles of the proposed motorized trails travel through Severe erosion rating soils.

Although this route currently exists, Alternative 3 would result in some increase in TSRC and DD, since soils would be newly committed to use as a motorized trail and experience the associated impacts. Approximately 95% of the proposed route is over soils with Slight to Moderate erosion rating, and roughly 5% have a Severe erosion rating.

Under Alternative 3, this action would result in no change to the TSRC since the trail would still exist as a commitment to the soil resource. There would be no change, to a potential reduction in DD with the exclusion of motorized use disturbance. Exclusion of motorized use may allow surface litter and vegetation to encroach and narrow the active trail tread, which has the potential to reduce soil displacement. This action would reduce impacts to soils with Severe erosion potential over approximately 2.15 miles.

This action under Alternatives 3 and 4 would result in no change to the TSRC or in DD. The current road network would be maintained in its existing condition, with street legal motorized use continuing.

Wild Rivers Ranger District

This proposed activity under Alternative 3 would have no effect to the TSRC since the road beds would still be committed to a travel route. There would be an increase in DD since the travel bed would be going from a closed state, where organic litter and vegetation have the opportunity to collect and grow on the road surface, to an actively used state that would result in regular “fluffing” of the travel-bed surface from wheel action that is easily susceptible to soil displacement. All Maintenance Level (ML) 1 roads being considered with this action are located along ridgelines in soils developed from serpentinized parent materials. The majority of these routes are in areas rated as Slight for erosion potential.

Under Alternatives 3 and 4, this action would result in no change to the TSRC since the trail would still exist as a commitment to the soil resource. There would be no change, to a potential reduction in DD with the exclusion of motorized use disturbance. Exclusion of motorized use may allow surface litter and vegetation to encroach and narrow the active trail tread, which has the potential to reduce soil displacement. This action could have benefits to roughly 4 miles of roadbed on Severe erosion rating soils. Alternative 4 would prohibit motorized use on more miles of trail than Alternative 3.

This action under Alternatives 3 and 4 would result in no change to the TSRC since the road surface would be maintained. Access would still be allowed for permitted and limited administrative use. There could potentially be a slight reduction in DD over time, as less use could result in less opportunity for road surface erosion from particles loosened from traffic, and establishment of more surface litter and vegetation along the shoulder.

This action under Alternatives 3 and 4 would result in no change to the TSRC or in DD, since the current road network would be maintained in its existing condition, with street legal motorized use continuing.

Siskiyou Mountains Ranger District

This action would, proposed under Alternative 3, result in an increase in TSRC, and an increase in DD, since soils would be newly committed to use as a motorized trail and experience the associated impacts.

Soil landtypes 68 and 69 are generally moderately to well suited for trail development; landtype 61 is considered poorly suited due to shallow soils, steep slopes, and high rock outcrop percent. Landtype 69 limitations for trails include high soil creep rates and some wet areas. The entire length is estimated to be within a Severe soil erosion rating.

Under Alternatives 3 and 4, this action would result in no change to the TSRC since the trail would still exist as a commitment to the soil resource. There would be no change, to a potential reduction in DD with the exclusion of motorized use disturbance. Exclusion of motorized use may allow surface litter and vegetation to encroach and narrow the active trail tread, which has the potential to reduce soil displacement. Many of the landtype units have a natural stability of moderately unstable to very unstable, and eliminating motorized use can potentially reduce the chance of human-induced failures. The majority of the proposed activity is on soils with a Severe soil erosion rating. There would also be a reduction of impacts to some serpentinized soils.

High Cascades Ranger District

The location of the proposed play area (Alternative 3) is flat terrain within an existing borrow pit. The action would result in a continuation of the TSRC, and a potential increase in DD due to increased vehicular activities in the pit. Due to the flat terrain, effects to soils are expected to be very localized, and mostly contained within the pit.

This action would result in no change to the TSRC or in DD. The proposed activity would merely redefine the type of vehicle that is permitted to drive on portions of Forest Roads 34, 37, 3705, and 3720.

Alternative 4 proposes a reduction in motorized use over current conditions, by providing increased protection to sensitive areas from motorized travel. In general, the effects to the soil resource are similar to those in Alternative 3, but with the elimination of motorized trails within Botanical Areas and areas with serpentine soils, there would be an overall beneficial effect to the soil resource through reduction in Detrimental Disturbance.

Over time, the Total Soil Resource Commitment to those trails would turn back to forest soil productivity. In addition, the conversion of Maintenance Level 1 roads to motorized trails that is proposed in Alternative 3 would not occur with this alternative, which would result in maintaining the current condition of those ML1 roads.

The Boundary Trail and all connectors would also prohibit motorized use, which would have no effect to the TSRC since it would still be committed as a trail, and could have minor beneficial effect to DD if litter and vegetation encroach and narrow the active tread, and with the likely reduced amount of traffic overall that would be “fluffing” the trail surface making it easily erodible.

Alternative 4 would limit off-road parking for dispersed camping and day use to generally 300 feet from the centerline of designated roads. Effects would be similar to Alternative 2 and 3, except that there would be a greater reduction in roads open to this dispersed use than in Alternative 3. Therefore, more dispersed camping and day use sites, and associated access spurs, would have the opportunity to recover naturally from DD associated with those impacts.

Summary

The following table summarizes the differences in the Action Alternatives in relation to the soil indicators described earlier in this section.

Table III-3. Comparison of Alternatives - Soil Indicators

Forest-Wide Soil Indicators	Alternative 2	Alternative 3	Alternative 4
Acres of forest designated open to cross-country motor vehicle use	275,000 acres	0 acres	0 acres
Miles of road surface	5,914 miles	5,914 miles	5,914 miles
Miles of motorized trails	253 miles	194 miles	114 miles

d. Cumulative Effects

The geographic scope of the cumulative effects analysis selected is the entire RRSNF, since the routes allowing public wheeled motor vehicle use occur within this area and the effects are likely to occur within this area.

Other actions and activities that have the potential to have cumulative effects to the soil resource include fuel treatments and fire, range management, minerals management, recreation, timber harvest and vegetation treatments, road and right-of-way management, special uses and state and county easements.

Fuels reduction projects and prescribed fire are on-going across the Forest. Project designs to protect the soil resource greatly minimize or avoid direct effects, and they are typically short-term. Detrimental effects to the soil resource from motorized use activities would remain at current levels with Alternatives 1 and 2, and potentially decrease with Alternatives 3 and 4 through elimination of cross-country travel and establishment of designated routes. Therefore there are no foreseeable adverse cumulative effects.

Livestock grazing is a use that is managed under proper use guidelines. The actions proposed in this project would not alter the grazing pattern or management of the livestock, and would therefore not include adverse cumulative effects.

Mining activities typically cause disturbance to the soil resource through the removal and/or displacement of vegetation and soil, and long-term commitments for access. Detrimental cumulative effects to the soil resource from future minerals development have the potential to increase at the Forest-level in all alternatives. However at this scale, these effects would be immeasurable. Alternative 4 would offset any effects through the beneficial consequences of eliminating motorized trails through Botanical Areas and areas with serpentine soils, in addition to the elimination of cross-country travel in Alternatives 3 and 4.

The greatest recreation effects to soil productivity are typically tied to activities involving roads, trails, campgrounds, and dispersed sites. These are areas that result in varying levels of total soil resource commitment to those activities. Varying levels of detrimental soil disturbance can also occur from motorized recreation activities off-roads and trails. Detrimental effects to the soil resource from motorized use activities would remain at current levels with Alternatives 1 and 2, and potentially decrease with Alternatives 3 and 4 through elimination of cross-country travel and establishment of designated routes. Therefore there are no foreseeable adverse cumulative effects. Additional effects would be offset by the elimination of motorized trails through Botanical Areas and areas with serpentine soils in Alternative 4. Cumulative effects would also potentially be offset by eliminating off-road parking for dispersed camping and day use beyond 300 feet from designated roads in Alternatives 2, 3 and 4.

Vegetation and timber harvest projects across the Forest are ongoing. Implementation of these projects require adherence to soil detrimental disturbance standards and guidelines designed to protect and maintain the soil resource. Projects are designed to not exceed allowable DD thresholds, and whenever possible, to mitigate past and current impacts to result in an overall decrease in TSRC and DD.

Detrimental effects to the soil resource from motorized use activities would remain at current levels with Alternatives 1 and 2, and potentially decrease with Alternatives 3 and 4 through elimination of cross-country travel and establishment of designated routes. Therefore there are no foreseeable adverse cumulative effects.

Proposals for special use permits and the action of granting an easement does not directly affect soil productivity. Indirect effects can vary depending on the action occurring within the easement, from a total soil resource commitment, to minor localized detrimental disturbance, to no disturbance. Detrimental effects to the soil resource from motorized use activities would remain at current levels with Alternatives 1 and 2, and potentially decrease with Alternatives 3 and 4 through elimination of cross-country travel and establishment of designated routes. Therefore there are no foreseeable adverse cumulative effects.

2. Aquatic Conservation Strategy

Will motorized vehicle use affect attainment of the Aquatic Conservation Strategy Objectives associated with the Northwest Forest Plan?

The Aquatic Conservation Strategy (ACS) was designed to facilitate the management and restoration of aquatic ecosystems within lands covered by the Northwest Forest Plan (1994). Specifically, the strategy is intended to protect anadromous fish habitat on federal lands within the range of Pacific Ocean anadromy. It is assumed that implementation of the ACS provides protection for all aquatic species present on the Rogue River-Siskiyou National Forest.

According to the Northwest Forest Plan Standards and Guidelines, the ACS was developed to improve and maintain the ecological health of watersheds and aquatic ecosystems contained within them on public lands. The four primary components of the ACS are designed to operate together to maintain and restore the productivity and resiliency of riparian and aquatic ecosystems; they include: 1) Riparian Reserves; 2) Key Watersheds; 3) Watershed Analysis; and 4) Watershed Restoration.

Riparian Reserves are established as a component of the Aquatic Conservation Strategy, designed primarily to restore and maintain the health of aquatic systems and their dependent species. Riparian Reserves also help to maintain riparian structures and functions and conserve habitat for organisms dependent on the transition zone between riparian and upland areas.

a. Background

Riparian Reserves include lands along all streams, lakes, ponds, wetlands, unstable areas, and potentially unstable areas that are subject to special Standards and Guidelines designed to conserve aquatic and riparian-dependent species. Standards and Guidelines apply to activities in Riparian Reserves that may otherwise retard or prevent attainment of Aquatic Conservation Strategy (ACS) objectives, as defined in the 1994 ROD.

Widths for Riparian Reserves necessary to ensure ACS objectives for different waterbodies are established based on ecological and geomorphic factors. Widths are typically one site potential tree height (150 feet for the Rogue River portion of the Forest (see RRNF White Paper #36), and 175 feet for the Siskiyou portion of the Forest (unless site-specially determined at the project scale), along each side of stream channels.

Widths are twice this distance along fish bearing streams. These widths are designed to provide a high level of protection to fish and riparian habitats.

Key Watershed designation is an additional component of the ACS that is applied to watersheds that contain at-risk fish species or anadromous stocks and that provide high quality water and fish habitat.

b. Compliance with Riparian Reserve Standards and Guidelines

The analysis of the existing conditions of the affected sub-watersheds relative to Riparian Reserve Standards and Guidelines is presented below for all alternatives considered in detail (1994 NWFP ROD, pages C-31 through C-39). The Recreation Standards and Guidelines were reviewed as being applicable relative to the types of actions being proposed under this project.

Recreation Management

RM-1. New recreational facilities within Riparian Reserves, including trails and dispersed sites, should be designed to not prevent meeting Aquatic Conservation Strategy objectives. Construction of these facilities should not prevent future attainment of these objectives. For existing recreation facilities within Riparian Reserves, evaluate and mitigate impact to ensure that these do not prevent, and to the extent practicable contribute to, attainment of Aquatic Conservation Strategy objectives.

RM-2. Adjust dispersed and developed recreation practices that retard or prevent attainment of Aquatic Conservation Strategy objectives. Where adjustment measures such as education, use limitations, traffic control devices, increased maintenance, relocation of facilities, and/or specific site closures are not effective, eliminate the practice or occupancy.

RM-3. Wild and Scenic Rivers and Wilderness management plans will address attainment of Aquatic Conservation Strategy objectives.

Table III-4. Evaluation of Applicable NWFP Riparian Reserve Standards and Guidelines

Standard and Guideline	No Action Alternative and Alternative 2	Alternative 3 Proposed Action	Alternative 4
RM-1	No new trails would be constructed within Riparian Reserves.	No new trails would be constructed within Riparian Reserves	No new trails would be constructed within Riparian Reserves
RM-2	No opportunity to adjust practices would be taken at this time.	Opportunities to correct problem areas within Riparian Reserves are captured by reducing motorized use in some areas.	Opportunities to correct problem areas within Riparian Reserves are captured by reducing motorized use in some areas.
RM-3	Not Applicable	Not Applicable	Not Applicable

c. Consistency with Aquatic Conservation Strategy for Action Alternatives

The Northwest Forest Plan requires project consistency with ACS with specific reference to nine ACS Objectives. Below, is a summation of the environmental analysis regarding consistency with the elements and components of the ACS Objectives (ACSOs). Additional discussion and rationale may be found in analysis documented under other issues in this Chapter including soils, hydrology, water quality, fisheries, and terrestrial wildlife.

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.

Hydrologic analysis of vehicle travel route changes in each of the 6th field watersheds affected shows that none of the Action Alternatives would result in measurable change over the existing condition at the watershed scale. Since effects lessen as drainage size increases, it is reasonable to conclude that effects at the landscape-scale are also undetectable. In addition, alternatives largely occur in headwater areas upstream of high value fish habitat. Thus, no measurable effects to fish populations or habitat are expected. Regardless of which alternative is selected, future land management actions would be designed to emphasize the protection or enhancement of aquatic systems in accord with ACS objectives.

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.

Proposed changes to motor vehicle travel under the Action Alternatives would have no detectable effect on spatial and temporal connectivity due to their small size compared to the subwatershed and larger scale and due to their location along small or ephemeral streams and ridgelines. Vehicle routes on gravel or native road surfaces generally do not alter connectivity. Extensive roading within a watershed may alter temporal connectivity by increasing peak flows however; hydrologic analysis for this project shows that the proposed changes are too small to have an effect that is detectable over the existing condition. From a fisheries perspective, no new passage barriers would be created, and all current passage barriers would remain following implementation of any alternative.

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

The existing condition alternative contains some roads within Riparian Reserves that are or have the potential to contribute sediment to streams and generate localized erosion. Action Alternatives provide for better administration to prevent future problems that are likely to develop as human population increases in southwestern Oregon. Alternatives 3 and 4 address some known local resource problems. Mitigation measures under all Action Alternatives provide for monitoring that would identify and repair road-related damage to aquatic resources. Since none of the alternatives identify road use or construction where vehicle use is not currently occurring, the Action Alternatives represent an adaptive approach to improving existing conditions including those affecting aquatic resources.

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.

In general, all alternatives would maintain current water quality conditions on the forest, as most alternative components merely change the use (i.e., type of vehicle) designation on an existing route or routes.

Accordingly, attributable and measurable changes to water quality conditions are not expected with the implementation of any alternative. Elimination of motorized travel on Trails #1169 and #1173 may help to attenuate sediment input at low water stream crossings on Lawson Creek and the Illinois River, however, even in this case, the action would undetectably contribute to water quality improvement and the receiving waters would remain impaired for temperature. Improvement of the Forest's unpaved road system falls into the realm of "Best Management Practices"; a recognized set of management actions that collectively benefit aquatic resources if consistently applied over a large area. Action Alternatives and mitigating measures are consistent with Best Management Practices.

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.

Implementation of any alternative would not appreciably alter the sediment regime within any watershed or overall at the subwatershed scale. Watersheds within the boundaries of the Rogue River-Siskiyou National Forest tend to be heavily roaded. This characteristic is largely attributed to historical level of timber harvest that occurred on the Forest. As discussed under Objectives 1 and 4, Action Alternative proposals alone affect too small a portion of the road system to have a detectable effect on sediment at the watershed scale.

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.

None of the alternatives would alter in-stream flows on the Forest. All alternatives are largely composed of alterations to use designations on existing travel routes. As such, no measurable changes to runoff patterns or stream flows are expected.

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

See response to Objective #6. Some of the affected roads contain numerous stream crossings, occur in the vicinities of unstable areas, or are within Riparian Reserves. The existing condition of some roads may be causing localized damage in Riparian Reserves that would not be detectable at a subwatershed level. Monitoring of these areas as proposed under mitigating measures would allow road related damage to be documented and repaired.

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.

Treatment of vegetation is not a component of any alternative being analyzed as part of this project. Thus, no alteration riparian vegetation would occur regardless of which alternative is implemented.

Objective 9. Maintain and restore habitat to support well-distributed populations of native plant, invertebrate, and vertebrate riparian-dependent species.

Implementation of any alternative would result in negligible effects to aquatic biota and habitat across the forest. In general, the actions included within the alternatives are related to changes in use designation on various routes across the Forest. Adverse impacts to aquatic biota and habitats related to the existing road system would continue to occur regardless of the alternative selected. These impacts include sedimentation, alteration of runoff, fragmentation of aquatic habitats, and increased risk of chemical pollution (Gucinski et al. 2001, Trombulak and Frissell 2000).

As an overall conclusion, the effects associated with all alternatives, either directly, indirectly, or cumulatively would not retard or prevent attainment of the Aquatic Conservation Strategy nor the nine ACS objectives, at the site, watershed, or landscape scales.

3. Air Quality - Vehicle Emissions

Will motorized vehicle use affect air quality or human health via vehicle emissions?

Designation of roads, trails, and areas could affect air quality on the Rogue River-Siskiyou National Forest. Possible contributing sources include motorized vehicle emissions or toxic air contaminants from emissions.

a. Background

Air quality is a concern for southwestern Oregon valleys where surrounding coastal, Cascade, and Siskiyou mountain ranges tend to hold in particulates produced by industrial plants, woodstoves, motor vehicles, outdoor debris burning, wildfire, windblown dust, and other sources. In particular, the air quality in the Rogue Valley has suffered largely because of winter temperature inversions trapping particulate matter and other pollutants (Jackson County 2008).

Meteorological Factors

Topography and weather patterns determine the extent that 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 and 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 (USDA 2008). On the RRSNF, the predominant wind direction is from a western inland flow (USDA 2008).

While air quality is an important consideration for actions occurring in southern Oregon, the issue has not proven to be a major concern along high elevation topographic features above 5,000 feet. Much of the Cascades and high elevation peaks are located above most inversion layers that form in southern Oregon and northernmost California. As an exposed feature located at high elevation where winds can be strong, air emissions are readily dispersed. Furthermore, the majority of emissions associated with these high elevation areas are unlikely to contribute to inversion related air quality in the southern Oregon (USDA 2004).

Air Quality Standards

National Ambient Air Quality Standards (NAAQS) were established by the Clean Air Act (CAA) of 1963 and subsequent amendments (42 USCA 7401 to 7671(q)). The Clean Air Act established two types of national air quality standards. Primary standards set limits to protect public health, including the health of "sensitive" populations such as asthmatics, children, and the elderly. Secondary standards set limits to protect public welfare, including protection against decreased visibility, damage to animals, crops, vegetation, and buildings. The CAA and its implementing regulations also establish air pollution emission standards for a variety of stationary sources. The Environmental Protection Agency (EPA) retains oversight authority, but has delegated enforcement of the CAA to the states. In Oregon, the Department of Environmental Quality (ODEQ) acts as the lead agency. The State, in turn, is required to develop and administer air pollution prevention and control programs. State standards must be either the same as, or more stringent than the CAA standards (USDA 2004).

Federal and State ambient air quality standards have been established for six common pollutants, also referred to as "criteria" pollutants.

b. Effects Mechanisms and Analysis Framework

Vehicle Emissions

The EPA has set standards for emissions of non-road engines and vehicles. The standards for emissions of oxides of nitrogen (NO_x), hydrocarbons (HC), and carbon monoxide (CO), are to ensure compliance with the Clean Air Act, and to regulate those emissions that contribute significantly to the formulation of ozone and carbon monoxide. Compliance with these standards requires manufacturers to apply existing gasoline or diesel engine technologies to varying degrees, depending on the type of engine (EPA 2002).

Before emissions controls on automobiles became significantly more effective, there was little concern about emissions from small engines; today, however, their relative contribution to air-quality is significant. This is because small engines, especially 2-stroke models (many of which are being phased out), do not burn fuels completely; thus their emissions contain the resulting by-products of incomplete combustion, including NO_x, sulfur dioxide (SO₂), CO, O₃, aldehydes, and extremely persistent polycyclic aromatic hydrocarbons (PAH) (USDI 2007). In fact, a very small, 2-stroke engine running for 2 hours emits the same amount of hydrocarbons as driving 10 cars for 250 miles (CEPA 2008).

While some pollutants, such as CO, are directly emitted, others are formed in the atmosphere from precursor emissions. Such is the case with ozone, which is formed in the atmosphere when Reactive Organic Gases (ROG) and NO_x precursor emissions react in the presence of sunlight. Particle Matter (PM), which includes PM₁₀ and PM_{2.5}, is a complex pollutant that can either be directly emitted or formed in the atmosphere from precursor emissions. PM precursors include NO_x, ROG, SO_x, and ammonia (NH₃) (USDI 2007).

OHV emissions also contain a variety of heavy metals, including zinc, copper, nickel, chromium, and lead. Concentrations of lead particles along roads have been correlated with traffic volumes. Lead concentrations have been found to diminish notably within a few hundred feet of road edges. Although heavy metals from gasoline have declined due to control policies, they persist in soils and continue to move through the environment when contaminated soils are dislodged (USDI 2007).

Pollutants emitted from exhaust can also cause a variety of impacts on vegetation. Carbon dioxide may function as a fertilizer and cause changes in plant species composition. Nitrogen oxides also may function as fertilizers, producing similar effects along roadsides. Sulfur dioxide, which can be taken up by vegetation, may result in altered photosynthetic processes. In some species, these same pollutants can also cause leaf injury, reduced growth, and death (USDI 2007).

Vehicle emissions on the Forest are most concentrated along secondary highways (County and State). The Forest does not have jurisdiction on vehicle use levels or emissions in any of these concentrated motorized areas. Motorized vehicle use under the Forest's jurisdiction is more localized to system roads and motorized trails, which generally have less concentrated use where wind dispersion is commonly sufficient to avoid air quality concerns.

Toxic Air Contaminants

The 1990 amendment to the Clean Air Act included a list of 189 pollutants identified as hazardous to human health. These pollutants are known, or have the potential, to cause cancer, mutations, be toxic to nervous tissue, or reproductive dysfunction. Toxic air contaminant is defined as an, "air pollutant which may cause or contribute to an increase in mortality or serious illness, or which may pose a hazard to human health". Toxic air contaminants are usually present in minute quantities in the ambient air; however, their high toxicity may pose a threat to public health even at very low concentrations. In general, for those toxic air contaminants that may cause cancer, there is no concentration that does not present some risk. In other words, there is no threshold level below which adverse health impacts are not expected to occur. This contrasts with the criteria pollutants for which acceptable levels of exposure can be determined and where State and federal governments have set ambient air quality standards (USDA 2008).

The Oregon Department of Environmental Quality (ODEQ) has substantially increased its knowledge about toxic air contaminants, and the data indicate that control efforts have been effective in reducing public exposures and associated health risks. In 2003, the ODEQ established the Oregon Air Toxics Program to systematically identify air toxics and set up methods to reduce risks to communities throughout the state (ODEQ Policy 2008).

In August of 2006, working with the Air Toxics Science Advisory Committee, ODEQ determined Ambient Benchmark Concentrations (ABCs) for 51 air toxics. The committee is helping the ODEQ draft guidance for using ABCs to evaluate air toxics problems, design emissions reductions efforts and measure progress. The proposed future gradual phase-in of control strategies will likely continue to result in lower exposures for Oregon's citizens (ODEQ Analysis 2008).

The majority of the estimated health risk from toxic air contaminants can be attributed to relatively few compounds. The top 12 air toxics of concern in Oregon include: acetaldehyde, acrolein, arsenic compounds, benzene, 1,3-butadiene, chromium and compounds, diesel particulate matter (PM), formaldehyde, naphthalene, polycyclic organic matter (POM), 1, 1, 2, 2, tetrachloroethane, tetrachloroethylene (Perc). These 12 compounds pose the greatest known health risks based on air quality data, or concentration estimates.

c. Direct and Indirect Effects of Alternatives

Vehicle Emissions

Although all alternatives would result in vehicle emissions and the production of pollutants such as PM₁₀ and PM_{2.5}, CO, NO_x, VOCs, and heavy metals, the direct effects of the **No Action Alternative and Alternative 2** would be negligible. Effects of these two alternatives would neither increase nor decrease current levels of vehicle emissions.

The direct effects of **Alternative 3 (Proposed Action)** would be insignificant. This alternative would only construct two new miles of motorized trails. This increase in trail miles and would be so minute, in comparison to the existing miles of motorized roads, trails, and areas that there would be virtually no measurable increase in vehicle emissions. Furthermore, this alternative would remove 275,000 acres of cross-country motorized use, thus reducing the amount of vehicle emission produced as a whole, as well as compensating for the added emissions created by the proposed two new miles of trails.

The direct effects of **Alternative 4** would be insignificant. Alternative 4 would also remove 275,000 acres of cross-country motorized use, thus reducing vehicle emissions. Additionally, Alternative 4 would slightly further reduce vehicle emissions by prohibiting motor vehicle use in Inventoried Roadless Areas and, except on existing roads, in Botanical and serpentine areas.

There are two indirect effects of all the Action Alternatives, both would be unsubstantial. The first effect is that the alternatives could indirectly impact vegetation along roads and trails. The second effect is that the alternatives could contribute to the formation of ozone in the atmosphere. Both of these indirect effects would have no measurable difference between the No Action Alternative and Alternative 2. The Proposed Action would possess slightly less indirect effects, while Alternative 4 would hold the lowest associated indirect effects from vehicle emissions.

Contaminants

Although all alternatives would result in vehicle emissions of toxic air contaminants, the direct effects of the **No Action Alternative and Alternative 2** would be negligible. Effects of these two alternatives would neither increase nor decrease current levels of toxic air contaminants produced by vehicle emissions.

Direct effects of the **Alternative 3 (Proposed Action)** would be insignificant. This alternative would only construct two new miles of motorized trails. This increase in trail miles and would be so minute, in comparison to the existing miles of motorized roads, trails, and areas that there would be virtually no measurable increase in toxic air contaminants via vehicle emissions. Furthermore, the Proposed Action Alternative would remove 175,000 acres of cross-country motorized use, thus reducing the amount of toxic air contaminants produced as a whole, compensating for the added toxic air contaminant emissions created by vehicles operating on the proposed two new miles of trails.

As with the Proposed Action, the direct effects of **Alternative 4** would be negligible. Alternative 4 would also remove 275,000 acres of cross-country motorized use, thus reducing toxic air contaminants emitted from vehicles. Additionally, Alternative 4 would slightly further reduce vehicle emissions by prohibiting motor vehicle use in Inventoried Roadless Areas and, except on existing roads, in botanical and serpentine areas.

The indirect effects of all the alternatives for contaminants would be unsubstantial. The effects of all alternatives could indirectly impact users who come in contact with toxic air contaminants and later discover they have cancer or give birth to children with birth defects. Although, considering the very short duration of exposure to toxic air contaminants, the likelihood of users experiencing these effects later in life as a result of riding on the RRSNF is quite low. These indirect effects would have no measurable difference between the No Action Alternative and Alternative 2. Alternative 3 would possess slightly less indirect effects, while Alternative 4 would hold the lowest associated indirect effects stemming from toxic air contaminants associated with the alternatives.

d. Cumulative Effects

Cumulative effects of motorized travel on air resources are unique in that past impacts to air quality are not usually evident. The emissions associated with motorized travel would be cumulative only with concurrent local emission sources. Since motorized emission sources on the Forest are localized and transient, actual cumulative combinations of emissions are minor and do not result in significant effects.

The cumulative effects of toxic air contaminants produced by motor vehicles emissions would result in only negligible differences than those currently experienced. Toxic air contaminants emitted from motor vehicles driving on the forest transportation system combined with toxic air contaminants produced by the implementation of other projects on the Forest, such as prescribed burning and harvest operations, could have cumulative effects. Implementation of prescribed burns and harvest operations on other federal, state, or private lands, could also contribute to toxic air contaminants, contributing to health risks. It is not possible to predict the amount of toxic air contaminants contributed by these other sources, although they are not likely to be cumulatively significant.

4. Air Quality - Dust and Asbestos

Will motorized vehicle use affect air quality or human health via dust or naturally occurring asbestos?

Designation of roads, trails, and areas could affect air quality on the Rogue River-Siskiyou National Forest. Possible contributing sources include motorized vehicle disturbance to soils creating dust or effects from serpentine soils containing asbestos.

a. Background

Topography and weather patterns determine the extent that 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 and 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 (Jackson County 2008).

The physical shape of landscapes interacts with and controls some weather patterns that influence particulate dispersion. On a local or regional basis, the air flow in southern Oregon is channeled by mountain ranges. On the RRSNF, the predominant wind direction is from a western inland flow (USDA 2008).

b. Effects Mechanisms and Analysis Framework

Fugitive Dust

Atmospheric dust arises from the mechanical disturbance of granular material exposed to the air. Dust generated from open sources is termed “fugitive” because it is not discharged to the atmosphere in a confined flow stream.

Fugitive road dust can be a result of motor vehicle use on dry road surfaces. 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 of time after the vehicle passes. Surfaced roads produce a relatively smaller amount of dust than do native surface roads, especially during dry weather.

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, and the moisture content of the road surface (EPA 2002).

The potential drift distance of particles is governed by the initial injection height of the particle, the terminal settling velocity of the particle, and the degree of atmospheric turbulence. Theoretical drift distance 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, (particularly Inhalable Particles, PM 10 and PM 2.5), have much slower gravitational settling velocities and are much more likely to have their settling rate retarded by atmospheric turbulence and dispersed over much greater distances from the source (EPA 2002).

Fugitive dust is the primary contributor to elevated levels of particulate matter. Effects of air-borne particulates depend on the size of the particle. Larger dust particles tend to settle out of the air and are not considered to have a significant health effects. However, both long-term and short-term exposure to smaller particulate matter, 10 microns in diameter or less, are inhalable and pose increased health risks associated with respiratory illnesses. These finer particles can deposit deep in the lungs, causing early death in people with existing heart and lung disease. These effects tend to be most acute in the elderly and other at risk populations (MASA FEIS 2004).

Serpentine - Naturally Occurring Asbestos

Serpentine soils can contain naturally occurring asbestos (NOA). The minerals that crystallize as asbestos belong to two groups: serpentine (chrysotile) and amphibole. Serpentine, the host rock for chrysotile is present throughout the coastal mountains of southwestern Oregon. These minerals can have fibrous or nonfibrous structures; the fibrous type is called asbestos. Asbestos is made up of fiber bundles, which are composed of extremely long and thin fibers that can easily separate. Natural weathering and human activities may disturb NOA-bearing rock or soil and release mineral fibers into the air. Fragments can be analyzed to determine whether a sample is asbestiform, or fibrous, with a fair degree of certainty.

There are serpentine soils on the Ranger Districts with the exception of the High Cascades RD. See Soils Issue, this Chapter for more information on serpentine soils. Known asbestos deposits in Oregon are small, and Southern Oregon area mines have not been extensive (Bright and Ramp 1965). Information as to the levels of asbestiform minerals in serpentine soils on the Forest is very limited. A laboratory study of two soil pedons associated with serpentine parent material, Snowcamp and Serpantano, was conducted in 1994 by the USDA Soil Conservation Service. Results for the Snowcamp pedon were negative for the presence of asbestiform minerals. The Serpantano pedon was determined to have less than one percent asbestiform minerals in the 2C2 and 2CR horizons (Burt 1994).

Motor vehicles traveling across serpentine soils have the potential to create fugitive dust containing asbestos fibers. There is no health threat if NOA remains undisturbed and does not become airborne and inhaled (EPA 2008). However, if asbestos fibers become air-borne, they can penetrate body tissues and remain in the tissue of the lungs and abdominal cavity.

The fibers that remain in the body are thought to be responsible for asbestos-related diseases. The illnesses caused by asbestos may not be observed for twenty or more years. The most common diseases caused by breathing high levels of asbestos are asbestosis, lung cancer, and mesothelioma.

The risk of disease depends upon the intensity and duration of exposure to asbestos. State and federal health officials consider all types of asbestos to be hazardous. However, exposure to low levels of asbestos for short periods of time poses minimal risk. Furthermore, available evidence supports that exposure to non-asbestiform fragments is not likely to produce a significant risk of developing asbestos related disease (USGS 2001).

c. Direct and Indirect Effects of Alternatives

Fugitive Dust

Direct effects of the **No Action Alternative and Alternative 2** would be negligible. The current condition of motorized vehicles traveling on native surfaces and gravel roads does pose a risk of stirring up fugitive dust that could pose health risks and reduce visibility. However, these two alternatives would neither exacerbate nor improve current risks associated with fugitive dust conditions.

Under **Alternative 3**, the direct effects would also be negligible. This alternative would only construct two new miles of motorized trails. This increase in trail miles and would be minor, in comparison to the existing miles of motorized roads, trails, and areas that there would be virtually no additional measurable risks from fugitive dust. Furthermore, Alternative 3 would remove 275,000 acres of cross-country motorized use, thus reducing the health risks and visibility issues derived from fugitive dust, as well as compensate for the added dust created by the proposed two new miles of trails.

As with the Proposed Action, the direct effects of **Alternative 4** would also be negligible. Alternative 4 would also remove 275,000 acres of cross-country motorized use, thus reducing the health risks and visibility issues derived from fugitive dust. Additionally, Alternative 4 would further reduce fugitive dust by prohibiting motor vehicle use in Inventoried Roadless Areas and, except on existing roads, in Botanical and serpentine areas.

There are two indirect effects of all alternatives for fugitive dust. The first indirect effect is that suspended dust particles in the air could linger in the area or drift to areas where it could be inhaled by other users. The second indirect effect is that irritation, nuisance, or health risks from fugitive dust associated with the alternatives could result in both motorized and non-motorized users choosing no longer recreate in dust prone, dry, areas where motorized vehicles create dusty conditions. Motorized and non-motorized users would likely be displaced and begin to concentrate in areas where vehicles would not stir up high concentrations fugitive dust. Both of these indirect effects have no measurable difference between the No Action Alternative and Alternative 2. Although qualitative, Alternative 3 would possess slightly less indirect effects and Alternative 4 would have the lowest associated effects.

Serpentine - Naturally Occurring Asbestos

The direct effects of the **No Action Alternative and Alternative 2** would be negligible. The current condition of motorized trails traveling on serpentine soils does pose a slight risk of stirring up dust that could contain asbestos. However, exposure to low levels of asbestos for a short duration of time poses minimal risk of developing disease and there is little evidence of asbestiform minerals on the Forest.

The direct effects of **Alternative 3** would also be negligible. While this alternative would construct 2 new miles of motorized trails, these trails would not be built in serpentine soil areas. Therefore, there would be no additional risk of asbestos inhalation with this alternative as compared to the other alternatives.

Effects related to **Alternative 4** poses the lowest risk of all alternative for inhaling asbestos. As a result of this alternative, motorized vehicles would be eliminated from most serpentine areas except on existing roads. Therefore, nearly 139 less miles of trails would be available for motorized travel and thus pose a lower risk of asbestos inhalation than the current condition.

The primary indirect effect of all alternatives is that suspended asbestos particles in the air could linger in the area or drift to areas where other users could inhale asbestos fibers. Duration of exposure to other users would likely be too short to pose more than a negligible risk. There would be no measurable difference on the indirect effects of lingering asbestos particles between the No Action Alternative, Alternative 2, and the Proposed Action. Alternative 4 would pose the lowest potential effect having 139 fewer miles of trails available for motorized travel to kick up asbestos particles allowing them to drift.

d. Cumulative Effects

The direct effects of fugitive dust produced by motor vehicles operating on native surfaces and gravel roads would result in only negligible differences than those currently experienced. Fugitive dust particles stirred up from roads and trails, particularly PM₁₀ and PM_{2.5}, combined with other particles produced by the implementation of other projects on the Forest, such as prescribed burning and harvest operations, could have cumulative effects. Implementation of prescribed burns and harvest operations on other federal, state, or private lands, would also contribute to fugitive dust, contributing to respiratory health risks and visibility concerns. It is not possible to predict the amount of toxic air contaminants contributed by these other sources, although they are not likely to be cumulatively significant.

Motor vehicles stirring up asbestos fibers in combination with other activities creating suspended particles in the air could possibly cumulatively add to the effects of air-borne asbestos. The difference in cumulative impacts between alternatives cannot be quantified, and is not predicted to be substantially different. The motorized use designation project is not likely to adversely add to cumulative air-borne asbestos effects from this and other current and foreseeable activities.

5. Fire Risk

Will motorized vehicle use designation affect the risk of human caused fires or affect access for fire suppression?

This issue has two parts. The first concerns the potential for various forms of motorized travel that would be allowed under the alternatives to increase the risk of unplanned fire ignitions. The second part concerns the potential effects of motorized use management on the Forest's ability to suppress a wildland fire.

a. Background

Risk is defined as the chance of fire starting as determined by the presence and activity of causative agents. The causative agents for this analysis are limited to motorized vehicles and whether they are legally or illegally operated.

Operating motorized vehicles off designated trails and road systems has been prohibited on many areas of public lands administered by the Rogue River-Siskiyou National Forest since implementation of the Land and Resource Management Plans. In addition, motorized vehicle use is typically restricted during times of high fire danger through the implementation of the Forest's fire restrictions and Forest Closure Order process. Unwanted fire starts from the improper use of motorized off-road vehicles off designated trails and roads are rare. According to RRSNF fire occurrence records, approximately 1% of fire starts have been attributed to equipment⁸ fires over the last twenty years.

Roads and motorized trails provide access for fire suppression and ground-based fire suppression equipment; access to and from water sources, lookouts and helicopter staging areas; fire breaks for fire suppression; and from a safety standpoint, anchor points for pre-positioning firefighting resources and fire line construction.

⁸ "Equipment" fires include vehicles and other heavy equipment such as logging or road building equipment. Fires caused by OHV or standard passenger vehicles are not tracked separately.

In planning suppression strategies for fire events lasting several days or weeks, roads and motorized trails provide alternative transportation options. These options play an important role in developing a wider range of strategies, commensurate with management area objectives that address cost-effectiveness and public and firefighter safety.

b. Effects Mechanisms and Analysis Framework

The factors related to the probability for increased fire risk include the numbers of vehicles (frequency) and the potential for ignition. There are generally two potential causes of ignition related to motorized use. These include:

Hot exhaust systems and machine parts: In a forest environment, grass and other fine fuels such as tall grass, may come into contact with exhaust systems. In some cases, this material accumulates on a heat source, either the exhaust system or the brakes. The temperature of the exhaust system can easily reach the ignition point for grass. Fine fuels on the machine may ignite and fall to the ground, initiating a surface fire.

Sparks from the exhaust system: Many muffler systems can produce sparks. While these do not ignite as many fires as direct contact, they are an occasional cause. Spark arresters are an effective means to prevent this type of fire cause.

The mere presence of a vehicle on grass, for example, does not equate to a fire ignition. Environmental factors such as fuel moisture and weather conditions must also be considered. Road and motorized trail access are important considerations for fire suppression activities. They provide for a wide array of suppression tactic options. In a wildland fire situation, response time for suppression actions can become a critical factor, especially when human lives are at stake. Road access allows pre-positioning of firefighting resources in the immediate area. Where roads are present, suppression resources such as engines and hand crews are used. Conversely, helicopter crews and smokejumpers respond to backcountry wildfire incidents where roads are not present.

c. Direct and Indirect Effects of Alternatives

Alternative 4 proposes fewer miles of roads and trails available to the public for motorized use than the current condition (**Alternatives 1 and 2**) and **Alternative 3 (Proposed Action)**. The potential for various forms of motorized travel that would be allowed under the alternatives to increase the risk of unplanned fire ignitions is currently considered very small. Due to the relatively minor change in miles of roads and trails available for motorized use under each of the alternatives, the change in risk of an ignition is very small between alternatives and is considered too small to be measurable.

All Action Alternatives would maintain the existing roaded access around wildland-urban interface areas. In addition, none of the Action Alternatives would prevent the use of aviation assets, off-road vehicles, or the use of heavy equipment as necessary to initiate the appropriate suppression response for a wildland fire. Therefore, no alternative would create inaccessible areas on the forest.

However, roads and trails not available (prohibited) for public use would still be available for administrative access (including fire suppression). Though the Forest road system may influence the type of suppression activities, it would not affect the number of acres of forest available for fire suppression activity. Regardless of alternative, the number of acres available for fire management activities would remain constant. The alternatives may vary slightly in which resources are used for a particular wildfire, but those differences are too speculative to analyze.

d. Cumulative Effects

This cumulative analysis considers historical fire data on the forest and the influence of road access. It considers the likelihood of effects of the road system on future wildland fires. It also considers the likely increase in population of the surrounding communities. Although changes in the total miles of access may occur in the future as a result of project scale planning, these changes are not foreseeable.

Statistics show that lightning naturally causes most fire ignitions in this region. The second most common fire start is human-caused. As population increases into an area, it may be assumed that there would be a higher chance of wildland fire; however, several other factors must be taken into account. Fires that are started by humans are individual instances and cannot be predicted. Factors in these circumstances also include weather conditions and fuel conditions. Implementation of any of the alternatives would not have any adverse cumulative effects on the ability to take suppression action on wildland fires.

6. Federally Listed and FS Sensitive Plants

Will motorized vehicle use on the Rogue River-Siskiyou National Forest (especially motorized trails) affect rare, sensitive or federally listed botanical species?

A Biological Evaluation of the alternatives described in detail in Chapter II was conducted to evaluate potential effects on plants listed under the Federal Endangered Species Act, and on Forest Service Sensitive vascular plants, bryophytes, lichens, and fungi. This section (and its sub-sections) documents the steps, analysis, and findings of that Biological Evaluation; all information and findings are included within this Draft EIS.

a. Background

Federally-Listed Plant Species

Two Federally-listed plant species are known to occur along roads, trails, and/or in other areas under consideration in one or more of the Action Alternatives. They are *Fritillaria gentneri* (Gentner's fritillary) and *Arabis macdonaldiana* (McDonald's rockcress). One additional species, *Lomatium cookii* (Cook's lomatium), has potential habitat, but no known occurrences, along roads, trails, and/or in other areas under consideration in one or more of the Action Alternatives. A brief discussion of each species is provided below:

Gentner's Fritillary

Fritillaria gentneri (Gentner's fritillary) is a showy tall plant in the lily family, found in oak woodland and various mixed forest, brushlands, meadow edges, etc. The single known occurrence on the Forest has only a handful of individuals in an oak stand/meadow edge in the Waters Creek area of Wild Rivers Ranger District. This occurrence is not immediately adjacent to a road or trail, and it is in an area for which a closure order exists, prohibiting vehicle use off of existing roads and trails. Though the occurrence is close to both a Forest Service road and a trail, in gentle terrain, off-road use has not been a problem in the actual population area to date. Under all alternatives, off-road use would not be allowed off designated roads and trails in this area, and assuming adherence to the rules, this Gentner's fritillary population would not be affected by this activity.

There is also potential for *Fritillaria gentneri* to occur in suitable habitat at other sites on Siskiyou Mountains and Wild Rivers Ranger Districts within the Applegate River watershed. Some of these potential sites could be immediately adjacent to roads, trails, and/or in other areas under consideration in one or more of the alternatives.

McDonald's Rockcress

Arabis macdonaldiana (McDonald's rockcress) is a perennial herbaceous plant with rose-colored flowers in the mustard family, present on the Forest in serpentine areas of southern Curry County. It is known to be immediately adjacent to a road at one site only on the Forest. This site is on a rock outcrop on the road cut slope at a corner along Forest Road 4402. Other individuals are above and below the road, outside of the road prism. Road maintenance activities, if not properly coordinated, could threaten several individuals, though this is unlikely on such a low maintenance road, on this stable rock surface. The risk to these individuals is the same under all alternatives, because road maintenance would continue to occur at this site under all alternatives.

All other *Arabis macdonaldiana* known sites on the RRSNF are not near roads or trails. These known sites are far enough from roads or trails, or in steep enough places, that the likelihood of them being affected by off-road use is essentially zero under all alternatives.

Potential habitat for McDonald's rockcress exists on serpentine in southern Curry County in additional locations where this species is not currently known to occur. If McDonald's rockcress were present in undiscovered locations along existing open roads, there would be some risk that individuals could be lost during road maintenance. Since road maintenance activities have been occurring on these roads for decades, it is relatively unlikely that individuals still exist at roadside in vulnerable microsites where they are likely to be disturbed in the future by these ongoing activities. Also, even if present, they may be part of a population that extends well beyond the roadside, hence the viability of the population over the surrounding area may not be at risk. This risk would be the same under all alternatives because road maintenance would continue to occur on the same roads on serpentine in southern Curry County under all alternatives.

Cook's Lomatium

Cook's lomatium has a small amount of potential habitat, but no known occurrences, along a few roads, trails, and off-road, off-trail areas under consideration in one or more of the alternatives, on Forest Service lands on the west edge of the Illinois Valley. This herbaceous perennial prefers sunny low-lying areas in heavy soil, or at the edge of drying vernal-wet areas.

Forest Service Sensitive Vascular Plants, Bryophytes, Lichens, and Fungi

There are 101 vascular plants, 24 bryophytes (mosses and liverworts), 11 lichens, and 29 fungi, documented or suspected to occur on the Forest, which have been designated as FS Sensitive species. As such the Forest manages these species to maintain their viability, often conducting surveys for them, analyzing project effects during NEPA planning, and developing mitigation measures to reduce or eliminate impacts to these species. A listing of all these species is too lengthy to include here.

Spreadsheets of Forest Service and Bureau of Land Management (BLM) sensitive species lists for all classes of organisms and all National Forests in the Pacific Northwest and BLM districts in Oregon are available on the web at <http://www.fs.fed.us/r6/sfpnw/issssp/agency-policy/>. A listing of Forest Service Sensitive vascular plants, bryophytes, lichens, and fungi for only the Rogue River-Siskiyou National Forest is available from the Supervisor's Office on request.

All but a handful of these species are known to occur, or could occur, immediately adjacent to roads, trails, and/or in other areas under consideration in one or more of the Action Alternatives. Field Reconnaissance specifically for this Forest-wide Travel Management Planning effort was not conducted. The information offered below was gathered during 2-3 decades of previous botanical field work by Forest Service botanists and others. Estimates of effects of the alternative are professional opinion of the Forest Botanist, based on extensive familiarity with the Forest and its botanical resources. Where effects could not be determined for specific road or trail segments proposed to be constructed or "converted" from Maintenance Level 1 roads under Alternative 3, a field reconnaissance of that site, and subsequent re-routing or re-design if needed, is included as a mitigation measure for Alternative 3, before ground disturbance would occur,

Where Forest Service Sensitive vascular plants, bryophytes, lichens, and fungi occur immediately adjacent to roads, they may be lost during routine road maintenance activities such as blading, ditch clearing, culvert maintenance, brushing, debris clearing, contouring, weed control, etc. This is an ongoing risk, sometimes ameliorated at known sites when properly coordinated. This risk would remain the same under all alternatives because the level of road maintenance across the Forest is the same under all alternatives.

b. Effects Mechanisms and Analysis Framework

For a list of general assumptions with regard to this analysis refer to the beginning pages of Chapter III. The following list is specific to the analysis for Sensitive plants.

- Motorized vehicle use on and off established routes has affected or has the potential to affect Sensitive plant populations, either directly by damage or death to individual plants from wheel-traffic (stem breaking, crushing, etc.), or indirectly by altering the habitat through soil disturbance, changes in hydrologic functioning, or by the introduction of non-native, invasive plant species that can out-compete Sensitive species for water, sunlight, and nutrients.
- Motorized vehicle use is unlikely to impact certain Sensitive plant habitats due to the steep or rocky nature of the surrounding terrain.

- Motorized vehicle use is more likely to impact other Sensitive plant habitats such as meadows that exist on gentle slopes or flat terrain with little or no vegetation or natural barriers to motor vehicles.
- Impacts to Sensitive plants and their habitats vary across all alternatives and no alternative completely eliminates adverse effects to Sensitive plants. In general, alternatives with fewer miles of routes open for public wheeled motor vehicle use should have reduced effects to Sensitive plants and their habitats.

c. Direct and Indirect Effects of Alternatives

Federally-Listed Plant Species

Gentner's Fritillary

Under all alternatives there is some potential for individual Gentner's fritillary plants to occur undetected within the road prism and to be adversely affected by road maintenance activities. However road maintenance activities have occurred for many decades and the current risk to undetected Gentner's fritillary plants would not change under any of the alternatives. To date, very little of the potential and suitable habitat away from roads and trails receives any OHV use, because the steepness and forest vegetation is generally an effective barrier. However, under **Alternatives 1 and 2**, OHVs would not be confined to roads and trails in this area, and the potential for Gentner's fritillary plants (if they were present) and/or habitat to be adversely affected by off-road activity still exists. Under **Alternatives 3 and 4**, OHVs would not be allowed off designated roads and trails, and assuming adherence to the rules, any Gentner's fritillary population present would not be affected by their activity.

McDonald's Rockcress

Alternatives 1 and 2 allow motorized use on some trails in potential McDonald's rockcress habitat, less so under **Alternative 3**, and even less under **Alternative 4**. However, as long as OHVs stay on existing trail beds and the trail is wide enough for the vehicle, OHVs are likely to have effects on McDonald's rockcress that are no different than humans, pack stock, or wild animals walking along these trails; i.e., little possibility of harming individuals or populations.

Under **Alternatives 1 and 2**, OHV use may still occur off of roads and trails. If McDonald's rockcress were present in undiscovered locations in these areas, there is some risk of physical injury to plants or habitat from off-road use. However because of the barriers of steepness, brush, trees, and rocks, there is likely to be very little off-road use away from roads and trails and hence adverse effects to more than a few individual plants are unlikely.

Under **Alternative 3**, off-road and off-trail vehicle use would not be allowed. The closed Maintenance Level 1 road from Cedar Springs to Biscuit Hill would be converted to a motorized trail. There may be suitable habitat for McDonald's rockcress along this route, and there is some possibility that the species is present. The road is probably used already even though it is currently closed. But the conversion to an official motorized trail may involve new physical disturbance. If so, a botanical field reconnaissance to determine presence/absence of McDonald's rockcress would be required and protection measures implemented if the species were found in the trail bed or immediately adjacent.

Under **Alternative 4**, off-road and off-trail vehicle use would not be allowed. In serpentine areas (McDonald's rockcress habitat), motorized use on trails would also not be allowed. The closed Maintenance Level 1 road from Cedar Springs to Biscuit Hill would remain closed, not converted to a motorized trail, though vehicles may continue to use it illegally.

Alternatives 3 and 4 have somewhat less risk to McDonald's rockcress because off-road and off-trail use is not allowed. There is little difference in effects to McDonald's rockcress between Alternatives 3 and 4 because motorized trail use is not considered a threat to the species (as explained above) and a botanical survey conducted under Alternative 3 along the road to Biscuit Hill would prompt protection measures if the species were found to be present.

One area where off-road use has caused damage to McDonald's rockcress plants in the past, is nearby on Six Rivers National Forest at Sourdough Junction. The McGrew Road coming from Oregon terminates here. There have been repeated instances of vehicles driving off-road at this location, potentially damaging McDonald's rockcress plants that are present. A seasonal closure of part of the McGrew road to help prevent the spread of Port-Orford-cedar root disease would be implemented under all alternatives. This seasonal closure is expected to have little effect on the frequency with which vehicles leave the road in the Sourdough Junction vicinity, because most of the vehicle use on the McGrew road is in the summer, when the McGrew road would be open. Also, other, better, more frequently-traveled roads to Sourdough Junction would still be open year-round.

Cook's Lomatium

Under **Alternatives 1 and 2**, OHVs would continue to be allowed access to some of the suitable habitat areas for this species. Some of this suitable habitat is actually physically accessible to OHVs also, though it is unknown what damage to suitable habitat, if any, is occurring.

Under **Alternative 3**, vehicles would not be permitted off-road or off-trail. The allowed vehicle use on roads and trails in the suitable habitat areas is no different than under Alternatives 1 and 2.

Under **Alternative 4**, in addition to the prohibition of vehicles off-road or off-trail, there may be a few trails in suitable habitat for Cook's lomatium, in Botanical Areas and serpentine areas that would no longer be accessible to OHVs. However, as long as OHVs stay on existing trail beds and the trail is wide enough for their vehicle, effects to any Cook's lomatium plants that could be present would likely be little different than effects of humans, pack stock, or wild animals walking along these trails; i.e., little possibility of harming individuals or populations. Therefore there seems to be little if any increased benefit to Cook's lomatium (if it were present) from Alternative 4 compared to Alternative 3.

Summary of Effects of the Alternatives on Federally-listed plant species

Effects (mostly potential effects to currently unknown occurrences, if present) differ by species and by alternative as explained above. For all three species, all Action Alternatives would result in a "**May Affect, but is Not Likely to Adversely Affect**" (NLAA) determination for species or critical habitat. It is assumed that there would be no measurable change in the amount of use these routes currently receive. However, at this time there is no information that would allow the FS to meaningfully measure, detect, or evaluate potential effects. Therefore, though any effects may be discountable, an NLAA determination is made for listed plant species.

Forest Service Sensitive Vascular Plants, Bryophytes, Lichens, and Fungi

Vehicle use of existing open roads is expected to have little or no effect on Forest Service Sensitive vascular plants, bryophytes, lichens, and fungi across the Forest, because these species seldom occur on roadbeds where vehicles drive. This is also more or less true for trail surfaces whether or not OHVs are allowed to operate on trails. There is little difference in the level of disturbance to the trailside flora caused by humans, pack or saddle stock, wildlife, or wheeled vehicles, as long as the OHV tread width is less than the tread width of the trail, and vehicles truly stay on the trails.

Therefore, although the alternatives differ in the number and location of motorized vs. non-motorized trails, there is little difference among the alternatives in the degree of effect this activity has on FS sensitive vascular plants, bryophytes, lichens, and fungi.

Off-road and off-trail vehicle use is permitted on 275,000 acres under **Alternatives 1 and 2**. Even though very little of this acreage is actually accessible or frequently used by OHVs, this activity has the potential to adversely affect known and unknown occurrences of Forest Service Sensitive vascular plants, bryophytes, lichens, and fungi, by crushing plants or physically disturbing their substrate or habitat, or as vectors for non-native invasive species. Some local occurrences of these species could be at risk of extirpation by these off-road and off-trail activities allowed under Alternatives 1 and 2.

Off-road/trail use is not allowed under **Alternatives 3 and 4** (except in a small area that would be located on High Cascades Ranger District where no FS sensitive species occur) and therefore this extirpation risk from off-road/off-trail vehicle use would not exist (assuming adherence to the rules). So far, the only known places where there is high current extirpation risk from off-road/off-trail vehicle use are some areas where they are already not allowed, and the damage is from illegal off-road use. Examples are *Carex klamathensis*, *Viola occidentalis*, and *Perideridia erythrorhiza* occurrences in the Eight Dollar Mountain Botanical Area and parts of the Days Gulch Botanical Area.

Alternative 3 provides some additional indirect protection for Forest Service Sensitive vascular plants by closing some roads and restricting mixed use on others in the Eight Dollar Mountain, Day's Gulch, Canyon Creek, Rough and Ready/W. Fork Illinois River divide areas on Wild Rivers Ranger District. This provides additional discouragement, compared to Alternatives 1 and 2, to OHV operators that would be inclined to go off-road and off-trail and damage plants or habitat in these serpentine areas with high concentrations of rare and endemic plants.

Also under Alternative 3, the trail in the Bigelow Lakes Botanical Area, a trail system north of Briggs Valley on Wild Rivers RD, and the Echo Lake Trail on Siskiyou Mountains RD are proposed for closure to motorized vehicles. Though no damage to Forest Service Sensitive species has been observed so far in these locations, all of these trails have some trailside habitat for Forest Service Sensitive vascular plants accessible to OHVs, which could be adversely affected if OHVs left the trails. OHVs are not likely to be present on these trails if their use is not allowed there. Therefore there is less risk of any illegal off-road or trail use occurring.

Alternative 4 provides indirect protection for FS Sensitive species similar to Alternative 3, by reducing the likelihood that OHVs would be in the vicinity of sensitive species occurrences with operators that are tempted to illegally leave roads and trails, potentially damaging plants and habitat. The additional trails closed under Alternative 4 to motorized use in serpentine areas, the Boundary trail, and Botanical Areas, often have Forest Service Sensitive species occurrence and habitat which could be accessed and damaged by OHVs if their operators inclined to leave the trails.

Specific Trail Proposals under Alternative 3

There is specific new trail construction proposed on Gold Beach Ranger District under Alternative 3; 0.5 miles of new motorized trail that would connect to the Woodruff Trail (T36S, R13W, sec 9). The FS Sensitive vascular plant *Trillium angustifolium* is in this immediate vicinity. A botanical field reconnaissance of this proposed trail route is included as a mitigation measure to be completed before construction begins, with re-routing to be done if needed to avoid the Trillium or other FS sensitive species.

The Forest Service Sensitive vascular plants *Carex gigas* and *Arctostaphylos hispidula* are present immediately adjacent to a Maintenance Level 1 road in the Signal Buttes area on Gold Beach Ranger District that is proposed to be converted to a motorized trail under Alternative 3. Although there is a slight possibility of a few individuals being lost during this conversion, there is little new disturbance off the roadbed itself expected and the viability of the local populations of these species are not expected to be affected.

On Wild Rivers Ranger District, the Maintenance Level 1 road from Cedar Springs to Biscuit Hill is proposed to be converted to a motorized trail under Alternative 3. There are no known occurrences of *Lupinus tracyi* or some of the serpentine Forest Service Sensitive vascular plants, or the Federally-listed *Arabis macdonaldiana*, but the route has potential habitat for these species. Botanical field reconnaissance would be required along this route if there would actually be new disturbance/construction associated with the conversion. If any FS sensitive species are found, a re-routing or other design change would be made if the viability of the local populations is expected to be adversely affected. If any *Arabis macdonaldiana* individuals are found, a re-routing or design change would be made to protect individuals of that species.

On Siskiyou Mountains Ranger District, Alternative 3 includes the relocation and construction of approximately 1.2 miles of the Penn Sled Trail. There are no known FS sensitive vascular plants, bryophytes, lichens, or fungi in the proposed new location. A botanical field reconnaissance along this route before ground disturbing activity occurs would be needed. If any Forest Service Sensitive species are found, a re-routing or other design change would be made if the viability of the local populations is expected to be adversely affected.

On the High Cascades Ranger District, a motorized use play area (approximately 10 acres) is proposed under Alternative 3 near the junction of Forest Road 3050 and County Road 821 in an old Willow Lake Dam borrow area. There are no known occurrences of Forest Service Sensitive vascular plants, bryophytes, lichens, or fungi in this location and no potential habitat for them either. No botanical mitigation is proposed for this feature.

Summary of Effects on FS Sensitive vascular plants, bryophytes, lichens, and fungi

The viability of some local occurrences of Forest Service Sensitive vascular plants in the Eight Dollar Mountain and Day's Creek Botanical Areas is at risk from the adverse effects of illegal off-road and off-trail vehicle use. This is not an effect of any of the Action Alternatives, rather an effect of recreational misuse that the Forest Service has been unable to control.

Alternative 3 may partially alleviate this problem by restricting off-road opportunities in this general area. Alternative 3 has some specific components which would trigger site-specific botanical field reconnaissance, and project re-design if needed to reduce any impacts to species found during the field reconnaissance. When considering the actual components of all alternatives, the most meaningful difference in potential effects to these organisms is whether 275,000 acres of off-road/off-trail land are "available" for motorized vehicle use as described for Alternatives 1 and 2, or are closed to this activity as in Alternative 3 and 4.

The alternatives differ in numerous ways as described above. However, all alternatives "**may impact individuals or habitat (MIIH), but will not likely contribute to a trend towards Federal listing or cause a loss of viability to the population or species.**"

d. Cumulative Effects

Cumulative effects from other future ground disturbing activities could impact Sensitive plants and their habitat. However, project design, mitigation measures, and compliance with Forest Plan Standards and Guidelines should not allow direct adverse effects.

The Action alternatives for this project are expected to maintain or reduce effects from motorized use. Alternatives 3 and 4 would include a reduction in miles of routes open for public wheeled motor vehicle use adjacent to habitat and the prohibition of cross-country travel. Therefore at the scale of these Sensitive plant habitats (site-scale), there would be no additional or foreseeable risk from adverse cumulative effects.

7. Invasive Non-native Plants

Will motorized vehicle use on the Rogue River-Siskiyou National Forest affect the spread of invasive non-native plants?

Invasive non-native plants have the potential to alter the composition, structure, and function of wildland ecosystems. Of special concern for this planning effort are motorized vehicles as vectors for these species, and how the alternatives may affect the potential for these species to spread to new areas.

a. Background

In October 2005, the Regional Forester signed the Record of Decision (ROD) for *Pacific Northwest Region Invasive Plant Program; Preventing and Managing Invasive Plants*. This ROD amended Land and Resource Management Plans (LRMPs) in the region to include new Standards and Guidelines (S&Gs) applicable to invasive plants.

The 2005 ROD emphasizes prevention practices; provides updated treatment options including the use of herbicides with formulations containing one or more of ten active ingredients and it emphasizes restoration and long-term site management goals. The new Standards and Guidelines now provide the management framework for invasive plant prevention and control efforts on the Forest.

The Forest also has adopted *Best Management Practices for Noxious Weed Prevention and Management, Port-Orford-cedar Root Disease Prevention and Management, Sudden Oak Death Prevention and Management.--Interim Direction for the ROR/SIS National Forests--February 15, 2002.*

The 1999 Environmental Assessment and Decision Notice for *Integrated Noxious Weed Management on the Rogue River National Forest* identified the need to implement a program that would curtail the introduction and spread of noxious weeds on Forest. The control strategies include chemical, manual, mechanical, biological, and prescribed fire treatments.

The 2003 Siskiyou National Forest Decision Memo, “Non-Chemical Treatments on Invasive Plant Projects within the Siskiyou National Forest”, allows for control of invasive weeds using non-chemical methods, such as pulling, digging, hoeing, cutting, mowing, burning, mulching, and the introduction of biological control agents.

b. Effects Mechanisms and Analysis Framework

Non-native invasive plants are present on many parts of the Forest, particularly along roads. The Forest has an active prevention and control program for the worst of these invaders which are Oregon Department of Agriculture (ODA)-designated Noxious Weeds. Primary vectors for noxious weeds on our Forest are mostly people, vehicles, machinery, imported rock and fill. The vector for one species, the non-native houndstongue, is animal fur/hair/hides, and for another, bull thistle, it is wind. Invasive plants are sometimes inadvertently included in seed mixes. All kinds of disturbance (fire, logging, grazing, soil displacement, etc.) increase the likelihood that these invaders will establish and spread, once their propagules are present. ODA noxious weed lists can be viewed at <http://oregon.gov/oda/plant/weeds/lists.shtml>. A Forest-specific noxious weed list can be requested at the Supervisor’s Office. Road maintenance activities have the potential to spread invasive plants along roads. This risk is present under all alternatives and does not differ by alternative.

c. Direct and Indirect Effects of Alternatives

People and vehicles can and do spread invasive plants along roads and trails. The degree to which this currently occurs is reflected in **Alternatives 1 and 2**, and perhaps less so under **Alternative 3** (in which some roads and trails would be closed to vehicles but some Maintenance Level 1 roads would become motorized trails).

The expected degree of spread, or risk of spread of invasive plants along roads and trails via people and vehicles, under **Alternative 4** is similar to Alternative 3 with an additional reduced risk in Botanical Areas, serpentine areas and along the Boundary Trail. This is because OHVs would be prohibited on trails in these areas.

Under **Alternatives 1 and 2**, 275,000 acres of Forest Service land is available for off-road/off-trail motorized use, though in reality only a fraction of that is actually accessible. Under these alternatives, OHVs and their operators have the potential to spread invasive plant seeds/propagules into these off-road/off-trail areas over many parts of the Forest. If invasive plants become established away from roads and trails, they are hard to detect and, for ODA-designated Noxious Weeds, could remain untreated and spread further before detected and control efforts initiated.

Under **Alternatives 3 and 4**, uncontrolled off-road/off-trail OHV use would not be allowed on the Forest and, assuming OHV operators obey the rules, OHVs and their operators would not be a vector for invasive plants into off-road/off-trail areas.

Mitigation measures designed to prevent and control the spread of invasive non-native plants are expected to reduce the risk.

Under **Alternative 3**, a new OHV play area is proposed near Willow Lake, in and near an old borrow area from which Willow Lake Dam was constructed. This location is one of few known sites in SW Oregon for the noxious weed sulphur cinquefoil (*Potentilla recta*). There is concern that play area users could unknowingly transport sulfur cinquefoil seeds from the soil seedbank to their homes and other destinations, where new populations could establish, greatly reducing the current possibility of eradicating this noxious weed in SW Oregon. This concern would be greatest when the sticky clay soils at the proposed play area are wet and adhere readily to vehicles and OHVs.

Also present at the proposed play area site is medusahead grass (*Taeniatherum caput-medusae*), a serious rangeland noxious weed. The Forest has no effective way to get rid of medusahead once it establishes, and it has clinging seeds that are easily transported even in dry conditions. Unlike the cinquefoil, medusahead is frequently found, particularly on private lands, in the Butte Falls/Willow Lake area, and eradication from the overall area would not be possible.

Two other noxious weeds are close by the proposed new play area but not yet known to be within the exact area proposed for development. They are spotted knapweed and Dalmation toadflax. Besides the potential for off-site transport of these weeds, play area construction and the ground disturbance from play area users could create conditions that favor the increase of these weeds on-site.

See the mitigation prescribed in Chapter II for the proposed new play area under Alternative 3. This mitigation is likely to control the abundance of sulphur cinquefoil, medusahead grass, and other noxious weeds within the play area. It would reduce but not eliminate the probability of these species spreading to new locations. Since the new play area is not proposed under Alternatives 1, 2, and 4, and the site is not currently used for other purposes, the risk of noxious weed increase or transport is much smaller under these alternatives.

d. Cumulative Effects

On National Forest System lands, future projects would employ mitigation measures that are designed to reduce the potential for the spread or increased introduction of invasive plant species. It is unknown to what extent projects on private lands would lead to increased spread or introduction of invasive species.

It is not expected that the identification of motorized routes would substantially add to the incremental increase of the spread of invasive plants. Prohibiting cross-country motorized travel is expected to contribute toward meeting the regional goal of no net increase for invasive plants.

8. Invasive Pathogens

Will motorized vehicle use on the Rogue River-Siskiyou National Forest (especially motorized trails) affect the spread of invasive pathogens, e.g. *Phytophthora lateralis* and *Phytophthora ramorum*?

Phytophthora (meaning “plant destroyer”) is a genus of more than 70 described species of the Oomycetes (Brasier et al. 2006). Often referred to as “fungi”, *Phytophthora* species are “water molds” that are more closely related to marine algae than fungi (Erwin and Ribeiro 1996). Favored by moist conditions, *Phytophthora* species include some of the world’s most notorious plant pathogens. Two non native invasive pathogens, *Phytophthora lateralis*, the cause of Port-Orford-cedar root disease, and *Phytophthora ramorum*, the cause of Sudden Oak Death or Ramorum leaf and twig blight, are known to occur on the Rogue River-Siskiyou National Forest. While these two pathogens have slightly different life histories, their spread may be influenced by human activities that move infested soil, water, or organic material.

a. Background

Phytophthora lateralis

Port-Orford-cedar (*Chamaecyparis lawsoniana*) is native to an area along the Pacific Coast from Coos Bay, Oregon, to the mouth of the Mad River near Arcata, California. Its range extends from the coast to about 50 miles inland. There is also a small disjunct population in the Scott Mountains of California. On the Rogue River - Siskiyou National Forest, Port-Orford-cedar (POC) can be found from Iron Mountain on the northern boundary of the Gold Beach Ranger District south to the Oregon border. Pacific yew (*Taxus brevifolia*) is occasionally infected by *Phytophthora lateralis* (Kliejunas 1994). Observations and laboratory trials show that Pacific yew is much less susceptible to PL than POC. When found, infected yew is always in close association with many previously infected POC (Murray and Hansen 1997).

Phytophthora lateralis (PL) is a virulent, non-native root pathogen. It was introduced into the native range of POC in the early 1950s and its place of origin is unknown. It readily kills POC of all ages that are growing on sites favorable for infection. Once an area becomes infested, it is difficult to eradicate PL.

The range of POC is divided into three risk regions: North Coast, Siskiyou, and Inland Siskiyou (USDA-FS USDI-BLM 2004). The North Coast risk region is part of the Oregon Coast Range. This is an area of low mountains with high rainfall and dense coniferous forests. It has moderately sloping, dissected mountains and sinuous streams. The most important characteristic in terms of species composition is the occurrence of western hemlock as a dominant or codominant species.

The Powers Ranger District has the greatest concentration of POC in the world, from the South Fork of Coquille River to Iron Mountain. This District is also unique in having stands with compositions of POC up to 70 to 80 percent. Included within the District are the Port-Orford-cedar Research Natural Area, the Big Tree Viewing Area, (which includes the largest POC in the world at nearly 12 feet in diameter), and the Coquille River Falls Research Natural Area. The Research Natural Area is infested with POC root disease. The District has been active in the inventory of POC through district-wide road surveys in 1964, 1972, 1983, 1992, and 1999 and 2008. The 2008 inventory showed 48,019 acres of POC present on the District, of which 2,453 acres (5.1%) are infested with the PL root disease. Most of the roads on the District have been open to the public since their construction and have already become infested.

The Siskiyou risk region includes the Coastal Siskiyou, Siskiyou Mountains, and Gasquet Mountain ultramafics located in Oregon and California. In the northwest part of the region, the Coastal Siskiyou have highly dissected mountains and high gradient streams, as well as a few, small, alpine glacial lakes. This region has a high diversity of ecological conditions, which is reflected in the vegetation. In the middle of the region, the Siskiyou Mountains are higher and steeper than the other portions of the cedar's range in Oregon. The vegetation is dominated by Douglas-fir at low elevations, Jeffrey pine on ultramafic soils, and white fir and red fir series at higher elevations. In the south portion of this region, populations of POC are highly scattered across the landscape and within many vegetation types. Douglas-fir and tanoak are the predominate trees in this part of the region. The southern extreme of this region stretches to the southwest edge the Klamath Mountains and into the northern California Coast Range. Many of the isolated populations of POC in this part of the region are often found on ultramafic soils.

The Port-Orford-cedar populations inside the Biscuit Fire perimeter were updated in 2005. The 2005 inventory showed 24,127 acres of POC present of which 838 acres (3.5%) are infested with PL. Port-Orford-cedar inventory updates outside the Biscuit fire perimeter are ongoing. Current inventories show 84,484 acres of POC present, of which 8,264 acres (9.8%) are infested with PL.

Port-Orford-cedar can be found from Iron Mountain on the northern boundary of the Gold Beach District south to Mineral Hill. POC grows from near sea level up to approximately 4,700 feet at Chetco Peak in the Kalmiopsis Wilderness. Port-Orford-cedar is mostly found within 100 feet of the streams, but is also present in upland areas on many different soil types, including serpentine. Port-Orford-cedar is mixed with Douglas-fir, true firs, pines, and incense cedar. In the mixed conifer stands, POC crown closure is generally 5 to 20 percent, but can be up to 80 percent in small isolated areas.

Many of the POC within these districts are 200 to 400 years old and 20 to 60 inches in diameter. PL has occurred along forest roads since about 1960. The disease has spread to many stands, mostly along roads and streams, and including locations in the Kalmiopsis Wilderness following introduction.

Many of the POC within the Wild Rivers Ranger Districts range in age from 200 to 400 years and are 20 to 60 inches in diameter. Port-Orford-cedar root disease has been present along the Oregon side of the Grayback Road going toward Happy Camp, California, since about 1960. Sanitation removals were implemented on the California side to reduce the potential for further disease introduction. So far, the root disease has not been found on the California side of the Grayback Road.

In contrast, in Oregon, there has been considerable spread along this route and subsequent downstream movement in the years following introduction. The pathogen has spread to many stands, mostly along roads and down streams, east of Highway 199 on the Wild Rivers Ranger District. *Phytophthora lateralis* has infested the Grayback/Sucker Creek drainage near the Oregon Caves National Monument. The Wild and Scenic Illinois River and Briggs Valley area have a 6 to 40 percent stand composition of POC and are uninfested. Other major drainages in the Illinois Valley have scattered distributions of uninfested POC amidst steep topography.

Port-Orford-cedar is most often found in riparian areas within the Wild Rivers Ranger District. Generally, POC is within 100 feet of the stream; however, small groves of POC can be found on alluvial fans and benches along these streams. Crown closure in the streamside areas are from 10 to 50 percent. There are upland populations on the many different soil types, including serpentine. Port-Orford-cedar is mixed with Douglas-fir, true firs, pines, and incense cedar up to approximately 4,500 feet elevation. In these mixed conifer stands, POC crown closure is generally 5 to 20 percent. Before the Biscuit Fire, POC on serpentine soils could be found from Josephine Mountain south to the Oregon boarder, where POC was scattered with white, knobcone, and lodge pole pines. In other serpentine areas, POC can be found with incense cedar and Douglas-fir. In these areas, POC crown closures are less than 2 percent.

Phytophthora ramorum

In the mid-1990s, abrupt die-off of large numbers of tanoak (*Lithocarpus densiflorus*) and coast live oak (*Quercus agrifolia*) trees was observed on hillsides in California's Marin County. The cause of the die-off was unknown and local residents and the press coined the phrase "Sudden Oak Death" to describe the rapid onset of tree mortality they observed (Goheen et al. 2006). In 2000, University of California researchers identified a previously unknown *Phytophthora* species, as the causal organism after isolating it from cankers (localized areas of dead cambium) on dying trees (Rizzo et al. 2002).

Soon it was recognized that the same pathogen was causing leaf blight, stem cankers and tip dieback on nursery-grown rhododendrons and viburnums in Europe and the pathogen was formally named *Phytophthora ramorum* (Werres et al. 2001). Scientific evidence suggests that *P. ramorum* is a non-native pathogen in both North America and Europe, which has been separately introduced; however, its origin is unknown (Ivors et al. 2004, Rizzo and Garbelotto 2003, Rizzo et al. 2005). To date, millions of oaks and tanoaks in California have been killed on an estimated 2 million infested acres (Meentemeyer et al. 2008).

Phytophthora ramorum was first discovered in southwest Oregon (Curry County) forests in 2001, where it was killing tanoak (*Lithocarpus densiflorus*) and infecting Pacific rhododendron (*Rhododendron macrophyllum*) and evergreen huckleberry (*Vaccinium ovatum*) (Goheen et al. 2002). At that time there were nine infested forest sites ranging in size from 0.5 to 11 acres and totaling 40 acres on non-industrial private forest lands, industrial private forest lands and federal forest land administered by the Coos Bay District, Bureau of Land Management. *Phytophthora ramorum* probably was present at one location as early as 1998 (Hansen et al. 2008).

Treatments to eradicate the pathogen from infested sites began in Curry County during fall of 2001 and involved cutting, piling and burning infected plants and all nearby host vegetation. The use of injected herbicide to prevent sprouting of tanoaks was included, where possible, in the treatment prescription after 2003. Upon completion of burning most sites have been planted with non-host or conifer seedlings. All infested sites found since the initial discovery of the pathogen, regardless of ownership, have been treated. To date over 750 tanoaks have been found infected since 2001 on approximately 204 acres; altogether, about 2400 acres have been treated (A. Kanaskie, pers. comm. 2009). In all, two infested sites have been identified on the Rogue River-Siskiyou National Forest, one in 2006 and one in 2008. Sites are located approximately 1000 to 1500 feet from established roads; one site is located approximately 200 feet uphill from an established non-motorized hiking trail. Both sites, with a combined treatment area totaling approximately 35 acres, have been treated by herbicide injection, cutting, piling, and burning.

Most *Phytophthora* species are root pathogens; however, *P. ramorum* predominantly affects aboveground plant parts such as leaves, needles, boles, green twigs and woody stems (Davidson et al. 2003, Hansen et al. 2008). Over 100 plant species are known hosts including native forest species such as tanoak, oaks in the red oak group such as California black oak (*Quercus kelloggii*), Douglas-fir (*Pseudotsuga menziesii*), coast redwood (*Sequoia sempervirens*), Pacific rhododendron, evergreen huckleberry, and Pacific madrone (*Arbutus menziesii*) as well as important commercial nursery species such as rhododendron, camellia, Pieris and laurel. The most current host list is posted at http://www.aphis.usda.gov/plant_health/plant_pest_info/pram/. In Oregon, the list of native plants that have been found infected in the wild is much shorter; tanoak, evergreen huckleberry and Pacific rhododendron are usually the only infected species (Goheen et al. 2006).

Phytophthora ramorum is well adapted to the mild, wet conditions of the Pacific Coast. The pathogen produces small sacs (sporangia) of swimming spores (zoospores) that readily break off and can be spread in rain splash and wind. Multiple generations of spores may be produced during wet weather periods at any time of year (Hansen et al. 2008). The pathogen spreads from tree to tree as zoospores or sporangia in water: rain splash, drip and stem flow (Hansen et al. 2008). Longer distance spread in forests is facilitated by turbulent transfer of sporangia dislodged from upper crown infections in clouds and wind-driven rain (Hansen et al. 2008).

Phytophthora ramorum also makes thick-walled resting spores (chlamydospores) in infected plant parts that allow it to survive heat and drought and persist for months to several years in soil and plant debris collected adjacent to stumps of known infested trees (Davidson et al. 2008, Fichtner et al. 2007, Goheen et al. 2006). It has been shown that soil propagules of *P. ramorum* can be picked up and carried via soil adhering to hikers' shoes and on mountain bike tires (Cushman and Meentemeyer, 2008). *Phytophthora ramorum* can be detected in stream water using floating leaf baits; however, no observations have been made in Oregon that suggests streamwater as the source for new infections (E. Hansen, pers. comm. 2009). *Phytophthora ramorum* can also be moved over extreme long distances (continental, global scales) in infected nursery stock (Goheen et al. 2006).

b. Effects Mechanisms and Analysis Framework

Phytophthora lateralis

Phytophthora lateralis is spread via water or soil. A typical spread scenario involves infested soil being transported into an un-infested area on a vehicle or piece of equipment or, potentially, in infested water being transported in the tanks of fire engines or helicopter buckets during suppression activities. The infested soil falls off of the vehicle or spores are delivered via water and the pathogen first infects POC near the site of introduction. New spores from that infection are then washed downhill in surface water infecting additional hosts. This is especially lethal along drainages and creeks where infested water is channeled and flows near concentrations of healthy POC.

“Uninfested 7th field watersheds” are defined as watersheds with greater than 50 percent Federal ownership and with greater than 100 Federal acres in stands that include POC (not including plantations where POC did not previously occur), where at least the Federal lands are uninfested or essentially uninfested with PL. Uninfested POC stands within these watersheds are referred to as POC cores. POC cores are not necessarily contiguous acres. Analysis done for the 2004 Final Supplemental Environmental Impact Statement – Management of Port-Orford-Cedar in Southwest Oregon using existing Geographic Information Systems (GIS) stand mapping indicated there were 162 uninfested 7th field watersheds in Oregon, 144 on the Rogue River – Siskiyou National Forest. Stands with any level of POC are included.

Phytophthora ramorum

The spread of *P. ramorum* poses a potentially serious threat to the forest ecosystem function, wildlife habitats, fire behavior, landscape aesthetics, and the horticultural and timber industries. (Goheen et al 2006, Rizzo and Garbelotto 2003, Appiah et al. 2004, Hansen et al. 2008). Rizzo and Garbelotto (2003) speculate that the “broad host range of *P. ramorum*, the variability of symptoms between different hosts, and the pathogen’s aerial dispersal suggest that it has the potential to cause a cascade of long-term landscape changes.” In the California counties where Sudden Oak Death (SOD) was first discovered, the disease has already adversely affected ecosystem functions, increased fire and safety hazards and reduced property values in developed areas (Rizzo and Garbelotto 2003, Appiah et al. 2004, Goheen et al. 2006).

Federal (7 CFR Part 301, http://www.aphis.usda.gov/plant_health/plant_pest_info/pram/regulations.shtml) and State (ORS 603-052-1230 and ORS 603-052-1250, <http://egov.oregon.gov/ODA/PLANT>) regulations are in place to protect natural resources and horticultural industries from human-assisted spread of *P. ramorum*. These regulations restrict the interstate and intrastate movement of regulated and restricted articles from designated quarantine areas. Regulated articles, which may be moved from quarantined areas contingent upon the application of certain phytosanitary measures, include soil and nursery stock (except acorns and seeds), unprocessed wood and wood products (including firewood, logs, and lumber), and plant products (including wreaths, garlands, and greenery) of designated host plant species. Specifically, federal and state regulations prohibit the movement of soil from known infested sites or from within five meters of known infected plants unless it has been sterilized.

Restricted articles from quarantined areas, which are prohibited from moving outside the quarantine area except under permit, include bark chips, forest stock, and mulch of designated host plant species. The regulations also include provisions for the issuance of certificates and compliance agreements, as well as provisions regarding treatments for regulated articles and inspection and sampling protocols for nurseries shipping host plants interstate. Water is not currently a regulated article.

As of January 2008, a 160 square mile area of Curry County, Oregon is currently subject to quarantine as established under these regulations and is described as follows: the portion of Curry County that lies inside the area south of the northern border of T38S R12W sections 29 and 30, T 39S R13W sections 1, 2, 3, 4, 5, and 6, and T39S R14W sections 1, 2, 3, 4, and 5; then west of the eastern border of T38S R12W sections 29 and 32, T39S R12W sections 5, 8, 17, 20, 29, and 32, T40S R12W sections 5, 8, 17, 20, 29, and 32, and T41S R12W sections 5 and 8; then north of the southern border of T41S R12W Sections 7 and 8, T41S R13W Sections 23 and 24 to the intersection with US Highway 101 and then northeast of US Highway 101 to the intersection with T41S R13W Section 10 and then north of T41S R13W Sections 8, 9, and 10; then east of the western border of the Pacific Coastline. The 102,400 acre *P. ramorum* quarantine area includes approximately 20,000 acres of land administered by the Rogue River-Siskiyou National Forest.

Currently, motorized vehicle use does not influence the spread or intensification of *P. ramorum* on the Rogue River-Siskiyou National Forest. Infested sites are not near or adjacent to roads or motorized trails.

Should *P. ramorum* be confirmed on other sites on the Rogue River-Siskiyou National Forest, decisions related to motorized vehicle use shall comply with federal and state regulations regarding this pathogen.

c. Direct and Indirect Effects of Alternatives

Phytophthora lateralis

Potential for the spread of *Phytophthora lateralis*, the pathogen that causes Port-Orford-cedar root disease is not simply a function of how many acres are entered. Rather, it is a function of a number of factors including acres entered with healthy POC, acres entered with PL, management performed on these acres, season of activity on these acres, and sequencing of units containing POC and PL to name a few.

Employing a planned combination of treatments can reduce the probability of long-distance spread more than a single treatment. An integrated treatment program that uses a combination of sanitation treatments, vehicle washing treatments, road drainage improvements, timing of activities during dry seasons, using certified clean or Clorox bleach-treated water, scheduling treatments in uninfested before infested areas, regulation of special use activities such as cedar bough collecting, and public education efforts combined with road closures, has a suggested probability of pathogen spread between zero and two percent per activity (USDA Forest Service USDI Bureau of Land Management 2004).

Thirty-eight POC cores were burned in the Biscuit Fire and no longer contain the minimum 100 acres of POC needed to qualify as a POC core. In addition, one watershed was found to have thirteen percent PL infestation which removed it from the POC core list. Seventh field watersheds no longer qualify as POC cores if five percent or more of the POC core area becomes infested with PL. Because these watersheds sometimes empty into a larger stream that is infested, infestations within the lowest 2 acres of the watershed (and lowest 200 feet of stream) do not count against the current uninfested status or the 5 percent (USDA Forest Service 2004).

Under **all alternatives**, all currently unprotected, uninfested POC would be gated or closed. Motorized use would be expected to neither exacerbate nor reduce the current PL risk and rate of spread.

Phytophthora ramorum

All alternatives shall comply with federal and state regulations regarding *P. ramorum*. Soil from infested sites shall not be transported outside the currently designated quarantine area unless subjected to approved and officially verified sterilization treatment. Movement of restricted or regulated plant materials to locations outside the quarantine area shall comply with current regulations.

The current understanding of the role water-based propagules play in pathogen survival and spread is not well understood. Infested water is currently not a restricted article; however, to reduce the potential risks of spreading the pathogen, any water taken from infested streams for purposes such as dust abatement or construction for use outside the quarantine area shall be treated with Chlorox® according to label directions.

d. Cumulative Effects

The Rogue River–Siskiyou National Forest is within the North Coast and Siskiyou Risk Regions for POC. Of the 48,019 POC acres on the Powers Ranger District, 2,453 acres (5.1 %) are infested. Twenty percent of the sites in the North Coast Risk Region are considered to be high risk (25,250 acres). At this time approximately fifteen percent of the risk region is considered infested (18,900 acres). This level of infestation on the Powers Ranger district is below the infestation level for the Risk Region as a whole. In 100 years, the predicted amount of infested acres is predicted to increase to 17 percent of high-risk sites (approximately 20,800 acres).

For the Gold Beach and Wild Rivers Ranger Districts, there are approximately 84,484 acres of POC of which 8,264 acres are infested (9.4%). In this risk region, forty percent of the acres are considered to be at high risk (approximately 46,500 acres). Eleven percent of the Risk Region (12,800 acres) is considered infested. The current level of infestation is slightly below the eleven percent infested acres for the Risk Region as a whole. In 100 years, the predicted amount of infested acres is predicted to increase to 20 percent of high-risk sites (approximately 23,600 acres) (USDA Forest Service USDI Bureau of Land Management 2004).

These estimates cover all management activity for the Forest Service and BLM. A more complete discussion of risk and rate of spread can be found in the POC FSEIS (USDA Forest Service USDI Bureau of Land Management 2004). Application of the risk key and application of resultant management practices would make projects consistent with the mid- and large-scale geographic and temporal-scale effects described by the analysis in the Final Supplemental Environmental Impact Statement – Management of Port-Orford-Cedar in Southwest Oregon.

9. Terrestrial Wildlife Listed Species

Will motorized vehicle use affect wildlife species federally listed as Threatened or Forest Service Sensitive species?

A Biological Evaluation process was conducted for, Threatened, Endangered, and Sensitive (TES) terrestrial animal species for this designation process; all information and findings are included within this Draft EIS. It is Forest Service policy to minimize adverse effects to the habitat of listed Threatened or Endangered species and to minimize adverse effects to designated Critical Habitat for listed species as well as to protect individual organisms from harm or harassment as appropriate.

The purpose of this evaluation is to determine and document the possible effects that the proposed activity and alternatives would have on any Proposed, Endangered, Threatened, or Sensitive (PETS) wildlife species (FSM 2672.4). A second objective of this evaluation is to ensure these species receive full consideration in the decision-making process, to maintain species viability and meet defined recovery goals. The Biological Evaluation process (FSM 2672.43) provides a description of office analysis, and mitigation activities necessary to ensure proposed management actions will not likely jeopardize the continued viability of:

- Species listed or proposed to be listed as Endangered or Threatened by the USDI Fish and Wildlife Service.
- Species listed as Sensitive by the USDA Forest Service Region 6 (USDA Forest Service 2008, FSM 2670.44).

a. Background

The US Fish and Wildlife Service (FWS) designates Proposed, Endangered or Threatened species under authority of the Endangered Species Act (ESA) of 1973 (Public Law 93-205), as amended. The Forest Service in the Pacific Northwest Region (FS Region 6) identifies and designates Sensitive species. This evaluation discloses impacts to those PETS animals that: 1), are known or are suspected to occur inside the action area based on confirmed sightings or geographic range, 2), have suitable habitat in or near the action area, and 3), would be affected by the proposed action or other alternatives. Furthermore, this process identifies conservation measures included in proposed actions that would eliminate, reduce, avoid or compensate for unwanted effects to listed species.

Section 7 of the Endangered Species Act (ESA) also directs each Federal agency to 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 their critical habitat. The ESA also directs each Federal agency to confer or consult with the appropriate Secretary on any action, which is likely to jeopardize or affect the continued existence of any species or its critical habitat.

In compliance with Section 7 of the Endangered Species Act (ESA)(1973 *et seq.*) and the Forest Service Biological Evaluation process for Proposed, Threatened, Endangered, and Sensitive (PETS) terrestrial wildlife species, the list of species potentially occurring within the RRSNF was reviewed.

The January 31, 2008 Pacific Northwest Region (R6) listing of species applicable to the RRSNF was reviewed in regard to potential effects on any of these Sensitive species by actions associated with this proposal. Pre-field and reconnaissance results and determinations are summarized below. Tables III-5 and 6 displays the process and which of the steps were necessary to complete the impact evaluation for each PETS wildlife species considered.

Table III-5. Steps in the Biological Evaluation Process – Threatened Species

FWS Listed Threatened Wildlife Species & Habitat	Pre-Field Review Existing Sighting or Habitat?	Field Reconnaissance Species/Habitat Present?	Conflict Determination Potential Conflict?	Effects Analysis Needed?
Northern spotted owl	YES	YES	YES	YES
Spotted owl Critical Habitat	YES	YES	YES	YES
Marbled murrelet	YES	YES	YES	YES
Marbled murrelet Critical Habitat	YES	YES	YES	YES

Table III-6. Steps in the Biological Evaluation Process – Sensitive Species

FS Sensitive Wildlife Species	Pre-Field Review Existing Sighting or Habitat?	Field Reconnaissance Species/Habitat Present?	Conflict Determination Potential Conflict?	Effects Analysis Needed?
American peregrine falcon	YES	YES	YES	YES
Bald eagle	YES	YES	YES	YES
Harlequin duck	YES	YES	YES	YES
Lewis' woodpecker	YES	YES	YES	YES
White-headed woodpecker	YES	YES	YES	YES
Northern waterthrush	NO	NO	NO	NO
California wolverine	NO	NO	NO	NO
Pacific fisher	YES	YES	YES	YES
Pacific pallid bat	YES	YES	YES	YES
Townsend's big-eared bat	YES	YES	YES	YES
Pacific fringe-tailed myotis	YES	YES	YES	YES
Northwestern pond turtle	YES	YES	YES	YES
Oregon spotted frog	YES	YES	YES	YES
Foothill yellow-legged frog	YES	YES	YES	YES
Siskiyou mountains salamander	YES	YES	YES	YES
California slender salamander	YES	YES	YES	YES
Black salamander	YES	YES	YES	YES

FS Sensitive Wildlife Species	Pre-Field Review Existing Sighting or Habitat?	Field Reconnaissance Species/Habitat Present?	Conflict Determination Potential Conflict?	Effects Analysis Needed?
Siskiyou short-horned grasshopper	YES	YES	YES	YES
Coronis fritillary	YES	YES	YES	YES
Mardon skipper	YES	YES	YES	YES
Insular blue butterfly	YES	YES	YES	YES
Hoary elfin	YES	YES	YES	YES
Johnson's hairstreak	YES	YES	YES	YES
Franklin's bumblebee	YES	YES	YES	YES
Siskiyou hesperian	YES	YES	YES	YES
Pristine springsnail	YES	YES	YES	YES
Crater Lake tightcoil	YES	YES	YES	YES
Pacific walker	YES	YES	YES	YES
Robust walker	YES	YES	YES	YES
Traveling sideband	YES	YES	YES	YES
Chace Sideband	YES	YES	YES	YES
Green sideband	YES	YES	YES	YES
Scale lanx	YES	YES	YES	YES
Highcap lanx	YES	YES	YES	YES
Oregon shoulderband snail	YES	YES	YES	YES
Klamath rim pebblesnail	NO	NO	NO	NO
Evening field slug	YES	YES	YES	YES
Western ridged mussel	YES	YES	YES	YES

Species background and accounts for FWS Threatened wildlife species and Critical Habitats, and FS Sensitive wildlife species, considered as part of this Biological Evaluation, are contained in Appendix C to this EIS, incorporated by reference.

b. Effects Mechanisms and Analysis Framework

See the assumption discussion at the beginning of Chapter III for a general list of assumptions used in this analysis.

Available literature indicates that public wheeled motor vehicle use of roads and trails affects wildlife, directly and indirectly, in a wide variety of ways. Although there is a considerable body of research describing effects of motorized roads and trails on wildlife, these interactions are complex, variable, and information gaps remain (Gaines et al. 2003, Trombulek and Frissell 2000, USDA Forest Service 1998). Road and trail-related effects can be categorized in a variety of ways; for this analysis they have been placed into the following three categories: effects resulting from human-caused mortality, effects resulting from changes in behavior, and effects resulting from habitat modification.

Human-caused mortality can be the result of collisions, hunting, trapping, poaching, negative human interactions, and collection. Death or injury from a vehicle hitting or running over an animal is well documented and affects the vast majority of terrestrial species, though to varying degrees (Trombulak and Frissell 2000). In general, road mortality increases with traffic volume and speed, and road kill on native surface forest roads is generally not significant for large mammals (USDA FS 1998). Small mammals and herptiles are more vulnerable because individuals are inconspicuous and slow-moving. Amphibians may be especially vulnerable to road mortality because their life histories often involve migration between wetland and upland habitats (Trombulak and Frissell 2000, USDA FS 1998). Raptors are also be vulnerable to collisions on forest roads due to their foraging behaviors, but the most substantial documented mortality has been along highways. Roads and motorized trails open areas to increased poaching or illegal shooting and losses from incidental trapping. These factors can be substantial for species with low population numbers for which even low rates of additive mortality may affect population stability. On the RRSNF, the current magnitude of these impacts or their influence upon populations is largely unknown.

Changes in behavior can include displacement or avoidance, impacts on breeding behavior, and physiological impacts. Gaines et al. (2003) reviewed literature on road- and trail-associated effects upon wildlife and found that alteration of use of habitats in response to roads or road networks was the most common interaction reported. Fifty to sixty percent of the 29 focal species reviewed were impacted in this manner (Gaines et al. 2003). Studies have documented shifts in an animal's home range area, shifts in foraging patterns, and disturbance of nesting or breeding behaviors resulting from motorized road or trail use and associated increased human recreation activity facilitated by motorized access (Foppen and Reijnen 1994; Johnson et al. 2000; Rost and Bailey 1979). Recreation activities (hiking, camping, fishing, shooting, etc.) that are associated with the access provided by motorized routes, result in indirect disturbance and displacement effects that often exceed the direct influence of the roads and trails.

Many species avoid areas in proximity to roads or trails, or exhibit flight behavior within a certain distance of route use, though studies documenting the magnitude and duration of behavioral responses are limited. Road usage by vehicles has a substantial role in determining animal's road avoidance behavior.

Black bear, for example, crossed roads with low traffic volume more frequently than roads with high traffic volume, and almost never crossed interstate highways (Brody and Pelton 1989). Perry and Overly (1977) documented displacement of deer up to 800 meters from major roads, and from 200 to 400 meters from secondary and primitive roads.

Activities that create elevated sound levels or result in close visual proximity of human activities at sensitive locations (e.g., nest trees), have the potential to disrupt normal behavior patterns. Studies of the effects of human disturbance upon wildlife have revealed that the immediate postnatal period in mammals and the breeding period in birds are time periods when individuals are most vulnerable to disturbance. Intrusion-induced behaviors such as nest abandonment and decreased nest attentiveness have led to reduced reproduction and survival in species that are intolerant of intrusion (Knight and Gutzwiller 1995). Foppen and Reijnen (1994), for example, found that the reproductive success of forest bird species declined in areas fragmented by roads. Wasser et al. (1997) found that stress hormone levels were significantly higher in male northern spotted owls (but not females) when they were located less than 0.25 miles from a major logging road compared to spotted owls in areas greater than 0.25 miles from a major logging road. Chronic high levels of stress hormones may have adverse consequences on reproduction or physical condition of birds, though these effects are not well understood.

Wildlife response to noise disturbance is complex, being neither uniform nor consistent. Delaney et al. (1999) reviewed literature on the response of owls and other birds to noise and concluded that birds generally flush in response to disturbance when distances to the source are less than about 200 feet and when sound levels are in excess of 95 decibels and the tendency of a bird to flush from a nest declines with experience or habituation to the noise, although the startle response cannot be completely eliminated by habituation.

Habitat modification includes habitat loss, fragmentation, edge effects, snag and down log reduction, routes for competitors, movement barriers. Road and trail networks remove habitat but also have a broader effect than just the conversion of a small area of land to route surfaces. Andren (1994) suggested that as landscapes become fragmented, the combination of increasing isolation and decreasing patch size of suitable habitat is adversely synergistic, compounding the effects of simple habitat loss. In particular, species associated with old forest habitats may be impacted by such effects. A decrease in interior forest patch size results in habitat loss and greater distance between suitable interior forest patches for sensitive species such as the northern spotted owl and American marten.

Additional habitat modification occurs as an indirect effect of managing roads or trails for public wheeled motor vehicle use. Trees posing a potential safety hazard (“hazard trees”) are removed along roads. These trees are typically snags that are within a tree-height distance from the road. This safety policy results in a largely “snag free” zone of 200 to 300 feet from a road’s edge, also affecting the recruitment of large down wood within this zone. Few hazard trees are typically removed along trails.

Major highways are known to create movement barriers for a number of wildlife species, particularly wide-ranging carnivores and ungulates, and are suspected of being a major factor in the decline of some forest carnivores, such as fisher and marten (Brody and Pelton 1989, USDA FS 2001a). The slower speed and lower traffic volume roads and trails that are being evaluated in the alternatives are less likely to create barriers to movement. However, the extent to which denser networks of roads and trails might result in barriers to movement for some wildlife species is unknown (USDA FS 2001a).

The following discussions are specific to those species on the RRSNF that have the potential to be affected.

Threatened Species and Critical Habitat

Spotted Owl Effects Mechanisms

There has been little data regarding the impacts of noise on spotted owls. However, the US Fish and Wildlife Service has recently analyzed the available data on spotted owls, murrelets and other species and has consulted species experts who have worked extensively with spotted owls to determine the extent to which above-ambient noises affect spotted owls. The results of this analysis indicate that spotted owls may flush from their nest or roost or may abort a feeding attempt of their young when the following activities occur up to the distances specified in Table III-7. This data has been used by the FWS in biological opinions and it is the FWSs current understanding of harassment distances based on the best available science. Consequently, it will be incorporated into this analysis as current guidance for harassment distances for various activities as it relates to adverse effects to the spotted owl from harassment due to disturbance. If the FWSs understanding of these distances change, adjustments to these distances may be recommended in the future.

Table III-7. Harassment Distances from Various Activities for Spotted Owls

Type of Activity	Distance at which spotted owl may flush or abort a feeding attempt
A blast larger than 2 pounds of explosives	1 mile
A blast of 2 pounds or less	120 yards
An impact pile driver, a jackhammer, or a rock drill	60 yards
A helicopter or a single-engine airplane	120 yards
OHVs, chainsaws	65 yards
Heavy equipment	35 yards

The risk to spotted owls from noise disturbance is tied to the timing of the activity and is highest when adults are defending young or eggs in a nest or are feeding and protecting recently fledged juveniles. During this period, the separation of adults and their young could result in death or injury to the young as a result of predation.

The leading known causes of mortality in juvenile spotted owls are starvation and predation by great horned owls (Miller 1989). The time period when adults or offspring are unable to move away from threats or noises is between the time that the eggs are laid and when the young can fly, which is generally about two weeks after the young fledge from the nest. After the young are able to fly, it is assumed that adults and young may move, but would stay together if annoyed by noise.

The timing of these development benchmarks (nesting and fledging) varies geographically, although spotted owls are generally believed to start laying their eggs around the beginning of March. In Oregon, data based on fledge dates indicate June 30th is the date by which almost all juveniles are capable of flight. This March 1 –June 30 period of vulnerability is called the “critical nesting period.”

Marbled Murrelet Effects Mechanisms

FWS listed the marbled murrelet as Threatened under the Endangered Species Act in 1992 (USDI FWS 1992b). The primary reasons postulated for the decline in marbled murrelet numbers included a loss of nesting habitat and poor reproductive success (USDI FWS 1997). Predation via corvids and or rodents is also considered a threat to reproductive success. Critical habitat for marbled murrelets was designated in 1996 and corresponds primarily to areas designated as Late-Successional Reserve in the Northwest Forest Plan (USDA and USDI BLM 1994, USDI FWS 1996).

The results of the same analysis by the FWS indicates that murrelets may flush from their nest or roost or may abort a feeding attempt of their young when the following activities occur up to the distances specific in Table III-8. These distances are somewhat different than the distances for spotted owls due to the available scientific data.

In addition, a visual harassment distance of a minimum of one hundred yards is included and is based on an effort by the Services' Regional Office to quantify both visual and auditory harassment to murrelets (USDI 2003). This data has been used by the FWS in two biological opinions and it is the Service's current understanding of harassment distances based on the best available science. Consequently, it will be incorporated into this analysis as current guidance for harassment distances for various activities as it relates to adverse effects to the murrelets from harassment due to disturbance. If the Services' understanding of these distances change, adjustments to these distances may be recommended in the future.

Table III-8. Harassment Distances from Various Activities for Marbled Murrelet

Type of Activity	Distance at which murrelets may flush or abort a feeding attempt
A blast larger than 2 pounds of explosives	1 mile
A blast of 2 pounds or less	120 yards
An impact pile driver, a jackhammer, or a rock drill	100 yards
A helicopter or a single-engine airplane	120 yards
OHVs, chainsaws	100 yards
Heavy equipment	100 yards

Above-ambient noises further than these distances from murrelets are expected to have either negligible effects or, if the sound reaches no murrelet, no effect to murrelet. The types of reactions that murrelets could have to noise that the FWS considers having a negligible impact include flapping of wings, the turning of a head towards the noise, attempting to hide, assuming a defensive stance, etc.

The risk to murrelets from noise disturbance is tied to the timing of the activity and is highest when adults have eggs in a nest or are feeding and protecting recently fledged juveniles. During these periods the separation of adults and their young could result in death or injury to the young as a result of predation. The leading known causes of mortality in juvenile murrelets are starvation and predation by corvids (Miller 1989).

The timing of these development benchmarks (nesting and fledging) varies geographically, although murrelets generally start laying their eggs around the beginning of April. In Oregon, August 5th is the date by which data indicate that all juveniles are capable of flight and most have likely fledged and returned to the ocean sites.

Forest Service Sensitive Species

Lewis' Woodpecker and White-Headed Woodpecker

Both Lewis' and white-headed woodpeckers are associated with ponderosa pine or in the case of Lewis' oak habitats. Nests are often in the large ponderosa pine snags or mature oaks while the birds forage on insects and acorn meat. In winter they store acorn meat in crevices in trees and power poles. Because this woodpecker does not usually excavate its own cavity, they have a close tie to older snags within the forest that are likely to contain cavities and have crevices for food storage. Habitat loss is due to a wide variety of concerns that include urbanization of valley floors, fire suppression and encroachment of conifer forests, timber harvest of pine components in the oak forests, etc.

Pacific Fisher

Impacts to fishers from human activities are not well documented. However, it can be expected that fishers, as with most wild animals, would exhibit aversive reactions to direct human contact or unnaturally loud noises. It can also be expected that avoidance reactions to human-caused disturbance would be elevated for females in dens or accompanied by young kits. Aubry and Raley (2006) identified the seasonal activity patterns for fishers in the southern Oregon Cascades. Females give birth in late March and generally move kits from the natal den to maternal dens at about 8-10 weeks. Near the end of July when kits are approximately 4 months old, they are more mobile and begin to travel with their mothers.

Siskiyou Mountains, California Slender, and Black Salamanders

Generally, these species are closely associated with rocky environments (talus, rock crevices, etc., and individuals may be found under surface debris, but will always be near sheltering rocks (Nussbaun et al. 1983). Activities that disturb the ground and debris have the most potential for impact. In addition, for individuals there is a potential for direct mortality from crushing by motorized vehicles on both the trails and seldom used roads.

Traveling/Chace Sideband, and Oregon Shoulderband

Although species accounts identify specific habitat types (i.e., talus, rock fissures, down woody debris) for these species, it is difficult to properly identify specific sites where they may be present. At least two of these species (*Monedenia sp.*) have been located on the Forest where they were associated with 'moist' conditions with some down woody debris. *M. chaceana* have also been found in early to mid-seral forest conditions on the High Cascades Ranger District. Activities that disturb the ground and debris have the most potential for impact. In addition, for individuals there is a potential for direct mortality from crushing by motorized vehicles on both the trails and seldom used roads.

Mardon Skipper

Mardon skippers use a variety of early successional meadow habitats which appear to vary by region (Kerwin 2007). Populations in southern Oregon occupy small (less than 0.5 to 10 ac), high-elevation (4,500 to 5,100 feet) grassy meadows within mixed conifer forests. (USFWS, Candidate notice of review 2005). Seven or eight locations were known from the Cascade Mountains in Southwest Oregon, most bordering the Cascade-Siskiyou National Monument, with populations ranging from a few to approximately 200 individuals (Kerwin 2007). In 2005, searches and surveys of populations on BLM and Forest Service lands in southern Oregon discovered several new sites. There are now a total of 23 known sites in southern Oregon. Trail construction or disturbance to meadow habitat would have an effect on this species.

c. Direct and Indirect Effects

Direct and indirect effects are analyzed on National Forest lands within the areas proposed for change under the Action Alternatives. The direct and indirect effects reflect the existing condition, which includes routes covered by the Federal Highway Safety Act, County Roads, and State and Federal Highways already designated for public use. The analysis includes NFS roads and trails. The analysis also includes unauthorized routes, or routes mapped through the route inventory process that are proposed to be designated for motorized use.

Threatened Species and Critical Habitat

Northern Spotted Owl

Above-ambient noises further than the distances shown in Table III-7 for spotted owls are expected to have either negligible effects or no effect to spotted owls. The types of reactions that spotted owls could have to noise that the FWS considers to have a negligible impact, include flapping of wings, the turning of a head towards the noise, hiding, assuming a defensive stance, etc. (USFWS 2003). OHV manufacturers and OHV groups have been working to reduce noise emissions from many models of recreational vehicles. However, many models (particularly 2-cycle) still produce decibel levels similar to chainsaws.

If potentially new disturbing activities are implemented during the spotted owl critical nesting season (March 1 – June 30) within the prescribed distances in Table III-7 of occupied or unsurveyed spotted owl habitat, those activities may adversely affect spotted owls by causing adults to flush from their nest site, abandon a nest, or cause juveniles to prematurely fledge, interrupt foraging activity, or result in increased predation due to less protection when the adult flushes. After June 30, it is presumed that most fledgling spotted owls are capable of sustained flight and can avoid harmful disturbances.

Effects to spotted owls due to disturbance under **Alternatives 1, 2, and 4** would result in a **no effect (NE)** determination for disturbance or habitat modification. This determination is based on the fact that no new trail construction/reconstruction would occur and no Maintenance Level 1 roads would be converted to motorized trails. There would be no change in the amount of use that existing roads and trail receive, with the exception of Alternative 4, where motorized use that currently exists on approximately 139 miles of trail would be prohibited.

Effects to spotted owls due to disturbance could occur under **Alternative 3 (Proposed Action)** and would result in a “**may effect, not likely to adversely effect (NLAA)**” determination assuming mitigation measures are applied. This determination is due to the proposed trail construction/reconstruction and conversion of Maintenance Level 1 roads to motorized trails under this alternative. It is assumed that there would be no measurable change in the amount of use these routes currently receive. However, at this time there is no information that would allow the FS to meaningfully measure, detect, or evaluate potential effects. Therefore, though any effects may be discountable, an NLAA determination is made for disturbance to spotted owls.

Due to the potential for vegetation clearing (it is estimated that several conifer trees less than 8 inches in diameter would be cut) on the proposed Penn Sled trail, a “**may affect, not likely to adversely affect (NLAA)**” determination is made for suitable habitat for **Alternative 3 (Proposed Action)**, assuming mitigation measures are implemented. This determination is due to habitat potentially being degraded by construction/reconstruction activities.

For all **Action Alternatives**, spotted owl habitat and dispersal opportunities overall would not be reduced from current conditions. In the absence of large-scale disturbance (wildfire, insects, and disease) the densities of northern spotted owls would likely remain stable, notwithstanding other threats identified by the Sustainable Ecosystems Institute report (Courtney et al. 2004) which include barred owls and West Nile Virus.

Northern Spotted Owl Critical Habitat

Critical Habitat for the northern spotted owl was designated in Federal Register 57 and includes the primary constituent elements that support nesting, roosting, foraging (NRF), and dispersal. Designated Critical Habitat also includes forest land that is currently unsuitable, but has the capability of becoming suitable NRF habitat in the future (FR 57 (10):1796-1837). Primary constituent elements of spotted owl critical habitat are those physical and biological attributes that are essential to species conservation. In addition, the Act stipulates that the areas containing these elements may require special management consideration or protection. Such physical and biological features, as stated in 50 DFR 4.2.4.1.2. For all **Action Alternatives**, there is a “**no effect (NE)**” determination made. No habitat within a designated CHU would be altered or affected.

2008 Spotted Owl Recovery Plan

On May 16, 2008, the US Fish and Wildlife Service released the final spotted owl recovery plan (USDI Fish and Wildlife Service 2008). The plan describes four primary recovery criteria, 36 recovery actions and establishes a network of Managed Owl Conservation Areas (MOCAs) totaling more than 6.4 million acres of federal land west of the Cascades’ crest.

The new information provided above and summarized by Courtney et al. (2004 and 2008) and the Final Spotted Owl Recovery Plan (USDI Fish and Wildlife Service 2008) does not alter analysis or change the effects determinations for any of the Action Alternatives. The concerns for spotted owls related to a population decline and the increase in barred owls are less in southwest Oregon than in other areas within the range of the spotted owl because the population in South Cascades is stable and the barred owl population is not as robust as in the northern portions of the range of the spotted owl (Courtney et al. 2004, 2008, Anthony 2005 and 2006).

Marbled Murrelet

None of the **Action Alternatives** would not remove or modify any murrelet habitat. The only proposed trail construction/reconstruction within the range of the murrelet occurs within a meadow where the trail follows an old wagon road. No habitat is present within this meadow.

Disturbance related effects would be the similar for the murrelet as described for the spotted owl. **Alternatives 1, 2, and 4** would result in a **no effect (NE)** determination for disturbance or habitat modification.

Effects to the murrelet due to disturbance could occur under the **Alternative 3 (Proposed Action)** and would result in a “**may effect, not likely to adversely effect (NLAA)**” determination assuming mitigation measures are applied.

This determination is due to the proposed trail construction/reconstruction and conversion of Maintenance Level 1 roads to motorized trails under this alternative. It is assumed that there would be no measurable change in the amount of use these routes currently receive. However, at this time there is no information that would allow the FS to meaningfully measure, detect, or evaluate potential effects. Therefore, though any effects may be discountable, an NLAA determination is made for disturbance to spotted owls.

If new or increased potentially disturbing activities are implemented within the prescribed distances (Table III-8) of occupied or unsurveyed murrelet habitat during the murrelet critical nesting season (April 1 – Aug 5), those activities would likely to adversely affect murrelets by causing adults to flush from their nest site, nest abandonment, premature fledging, interruption of feeding attempts, or increased predation due to less protection when the adult flushes. After August 5, it is presumed that most fledgling have returned to the ocean and disturbance from proposed actions within the prescribed distances shown in Table III-8. Between August 6 and September 15, project activities would not adversely affect murrelets, if daily timing restrictions are applied until September 15.

Marbled Murrelet Critical Habitat

Critical habitat for marbled murrelets was designated in May 1996 (61 FR 102:26256-26320). The Service has designated approximately 3.9 million acres of land as critical habitat, of which 78 percent (3.0 million acres) is located on Federal lands within the area covered by the NWFP boundary. For all **Action Alternatives**, there is a “**no effect (NE)**” determination made. No habitat within a designated CHU would be altered or affected.

Forest Service Sensitive Species

Table III-5 identifies R-6 Sensitive Species known or suspected to occur on the RRSNF. The following species were determined to have no conflict with the **Action Alternatives** because there are no known sightings or habitat potentially affected by analyzed actions, or the action area was determined to not be within the range of the species: **Northern waterthrush, California wolverine, Oregon spotted frog, and Klamath rim pebblesnail.** The determination for these species is “**No Impact.**”

Based on known or suspected species occurrence or suitable habitat the following species were analyzed and were determined to be unaffected by actions associated with the **Action Alternatives: American peregrine falcon, bald eagle, harlequin duck, Townsend’s big-eared bat, pallid bat, fringe-tailed bat, northwestern pond turtle, foothill yellow-legged frog, Siskiyou short-horned grasshopper, coronis fritillary, insular blue butterfly, hoary elfin, Johnson’s hairstreak, Franklin’s bumblebee, Siskiyou hesperian, pristine springsnail, Crater Lake tightcoil, pacific walker, robust walker, scale lanx, highcap lanx, evening fieldslug, and western ridged mussel.** Based on analysis, the determination for these species is “**No Impact.**”

Based on known or suspected species occurrence or suitable habitat the following species were analyzed and were determined to potentially incur effects, as described below. These effects are essentially and potential similar for all Action Alternatives.

Lewis' Woodpecker and White-Headed Woodpecker

Effects to Lewis' woodpecker and white-headed woodpecker due to disturbance under **Alternatives 1, 2, and 4** would result in a **“no impact”** determination. This determination is based on the fact that no new trail construction/reconstruction would occur and no Maintenance Level 1 roads would be converted to motorized trails. There would be no change in the amount of use that existing roads and trail receive, with the exception of Alternative 4, where motorized use that currently exists on approximately 139 miles of trail would be prohibited.

Generally, the new trail construction on the Siskiyou Mountains Ranger District is on a north-facing aspect where both ponderosa pine and oak habitats are very limited. Under **Alternative 3 (Proposed Action)**, roads “open” to the public are reduced by approximately 31 miles. However, approximately 23 miles of Maintenance Level 1 roads would be converted to motorized trails. Effects to these woodpecker species due to disturbance could occur under the **Proposed Action** and would result in a **“may adversely impact individuals, but not likely to result in a loss of viability on the planning area, nor cause a trend to federal listing or a loss of species viability range wide”** determination. This determination is due to the proposed trail construction/reconstruction and conversion of Maintenance Level 1 roads to motorized trails under this alternative. It is assumed that there would be no measurable change in the amount of use these routes currently receive. However, at this time there is no information that would allow the FS to meaningfully measure, detect, or evaluate potential effects. Therefore, though any effects may be discountable, a “may impact individuals” determination (MIIH) is made for disturbance to Lewis' woodpecker and white-headed woodpecker.

Pacific Fisher

Effects to the Pacific fisher due to disturbance under **Alternatives 1, 2, and 4** would result in a **“no impact”** determination. This determination is based on the fact that no new trail construction/reconstruction would occur and no Maintenance Level 1 roads would be converted to motorized trails. There would be no change in the amount of use that existing roads and trail receive, with the exception of Alternative 4, where motorized use that currently exists on approximately 139 miles of trail would be prohibited.

Effects to the Pacific fisher due to disturbance could occur under **Alternative 3 (Proposed Action)** and would result in a **“may adversely impact individuals, but not likely to result in a loss of viability on the planning area, nor cause a trend to federal listing or a loss of species viability range wide”** determination. This determination is due to the proposed trail construction/reconstruction and conversion of Maintenance Level 1 roads to motorized trails under this alternative. It is assumed that there would be no measurable change in the amount of use these routes currently receive. However, at this time there is no information that would allow the FS to meaningfully measure, detect, or evaluate potential effects. Therefore, though any effects may be discountable, a “may impact individuals” determination (MIIH) is made for disturbance for Pacific fisher.

Siskiyou Mountains, California Slender, and Black Salamanders

Under **Alternatives 1, 2, and 4**, there is no trail construction proposed nor is there any conversion of Maintenance Level 1 roads to motorized trails. For these alternatives, there is a determination of **“no impact”**.

Under **Alternative 3 (Proposed Action)**, the construction/reconstruction of 1.2 miles of trail through potential habitat on the Siskiyou Mountains Ranger District would affect approximately 1 acre of habitat for these species. In addition to potential habitat loss, there is a potential for direct mortality on individuals of these species from crushing by OHVs on both the new trail construction/reconstruction and where Maintenance Level 1 roads are converted to motorized trails. Therefore, a **“may impact individuals, but not likely to result in a loss of viability on the planning area, nor cause a trend to federal listing or a loss of species viability range wide”** determination (MIIH) is made.

Traveling/Chace Sideband, and Oregon Shoulderband

Under **Alternatives 1, 2, and 4**, there is no trail construction proposed nor is there any conversion of Maintenance Level 1 roads to motorized trails. For these alternatives, there is a determination of **“no impact.”**

Under **Alternative 3 (Proposed Action)**, the construction/reconstruction of 1.2 miles of trail through potential habitat on the Siskiyou Mountains Ranger District would affect approximately 1 acre of habitat for these species. In addition to potential habitat loss, there is a potential for direct mortality on individuals of these species from crushing by OHVs on both the new trail construction/reconstruction and where Maintenance Level 1 roads are converted to motorized trails. Therefore, a **“may impact individuals, but not likely to result in a loss of viability on the planning area, nor cause a trend to federal listing or a loss of species viability range wide”** determination (MIIH) is made.

Mardon Skipper

Under **Alternatives 1, 2, and 4**, there is no trail construction proposed within any meadow. For these alternatives, there is a determination of **“no impact.”**

Under **Alternative 3 (Proposed Action)**, the construction/reconstruction of 0.5 miles of trail through potential habitat on the Gold Beach Ranger District would affect some meadow habitat for this species. Therefore, a **“may impact individuals, but not likely to result in a loss of viability on the planning area, nor cause a trend to federal listing or a loss of species viability range wide”** determination (MIIH) is made. It is recommended that an additional survey of this site be conducted prior to any reconstruction. If surveys are conducted and no individuals are found, a **“no impact”** determination is warranted.

Summary

A summary of the determination for Threatened and Forest Service Sensitive species is displayed in Tables III-9 and III-10 below.

Table III-9. Effects Determination – Threatened Species

FWS Listed Threatened Wildlife Species & Habitat	Effects Determination			
	Alternative 1	Alternative 2	Alternative 3	Alternative 4
Northern spotted owl	NA	NE	NLAA	NE
Northern spotted owl Critical Habitat	NA	NE	NE	NE
Marbled murrelet	NA	NE	NLAA	NE
Marbled murrelet Critical Habitat	NA	NE	NE	NE

Codes for determinations:

NA – not applicable NE – no effect NLAA – may effect, not likely to adversely affect

Table III-10. Effects Determination – Forest Service Sensitive Species

FS Sensitive Wildlife Species	Effects Determination			
	Alternative 1	Alternative 2	Alternative 3	Alternative 4
American peregrine falcon	NA	NI	NI	NI
Bald eagle	NA	NI	NI	NI
Harlequin duck	NA	NI	NI	NI
Lewis' woodpecker	NA	NI	NI	NI
White-headed woodpecker	NA	NI	NI	NI
Northern waterthrush	NA	NI	NI	NI
California wolverine	NA	NI	NI	NI
Pacific fisher	NA	NI	NI	NI
Pacific pallid bat	NA	NI	NI	NI
Townsend's big-eared bat	NA	NI	NI	NI
Pacific fringe-tailed myotis	NA	NI	NI	NI
Northwestern pond turtle	NA	NI	NI	NI
Oregon spotted frog	NA	NI	NI	NI
Foothill yellow-legged frog	NA	NI	NI	NI
Siskiyou mountains salamander	NA	NI	MIH	NI
California slender salamander	NA	NI	MIH	NI
Black salamander	NA	NI	MIH	NI
Siskiyou short-horned grasshopper	NA	NI	NI	NI
Coronis fritillary	NA	NI	NI	NI
Mardon skipper	NA	NI	MIH	NI
Insular blue butterfly	NA	NI	NI	NI
Hoary elfin	NA	NI	NI	NI
Johnson's hairstreak	NA	NI	NI	NI
Franklin's bumblebee	NA	NI	NI	NI
Siskiyou hesperian	NA	NI	NI	NI
Pristine springsnail	NA	NI	NI	NI
Crater Lake tightcoil	NA	NI	NI	NI
Pacific walker	NA	NI	NI	NI

	Effects Determination			
	NA	NI	NI	NI
Robust walker	NA	NI	NI	NI
Traveling sideband	NA	NI	MIH	NI
Chace Sideband	NA	NI	MIH	NI
Green sideband	NA	NI	NI	NI
Scale lanx	NA	NI	NI	NI
Highcap lanx	NA	NI	NI	NI
Oregon shoulderband snail	NA	NI	MIH	NI
Klamath rim pebblesnail	NA	NI	NI	NI
Evening field slug	NA	NI	NI	NI
Western ridged mussel	NA	NI	NI	NI

Codes for determinations:

NA – not applicable

NI – no impact

MIH – may impact individuals, but not likely to result in a loss of viability on the planning area, nor cause a trend to federal listing or a loss of species viability range wide

d. Cumulative Effects

Present and foreseeable future actions that may affect terrestrial wildlife species or habitats on the Forest include: wildland fire, fuels treatments, livestock grazing, dam maintenance, minerals management, developed and dispersed recreation, timber harvest and vegetation treatments, reforestation, restoration, road management, and special uses. All of these activities will be designed to meet the direction provided within the Northwest Forest Plan and the local Land and Resource Management Plans (i.e., Forest Plans), and in accord with Aquatic Conservation Strategy objectives (NWFP 1994, Rogue River NF LRMP 1990, and Siskiyou NF LRMP 1989).

None of the alternatives would result in substantial direct or indirect adverse effects to terrestrial wildlife species. Thus, implementation of the project is not expected to result in detrimental cumulative effects to terrestrial wildlife species or habitat.

All routes that are being considered for designation within the alternatives of this project currently exist and are receiving some amount of use. Further, it is assumed that because of this existing use, regardless of which alternative is selected, detrimental effects to terrestrial wildlife habitat and populations from the motorized route network would either be reduced or maintained when compared to the current condition.

10. Management Indicator Species

Will motorized vehicle use affect species identified as LRMP Management Indicator Species, especially deer and elk within Big Game Winter Range areas?

Management Indicator Species (MIS) represent the issues to support recovery of Federally-listed species, provide continued viability of Sensitive species, and enhance management of wildlife and fish for commercial, recreational, scientific, subsistence, or aesthetic values or uses.

Management indicators representing overall objectives for wildlife, fish, and plants may include species, groups of species with similar habitat relationships, or habitats that are of high concern (FSM 2621.1).

An indicator species represents all other wildlife species which utilize a similar habitat type. Indicator species act as a barometer for the health of various habitats and will be monitored to quantify habitat changes predicted by implementation of the Forest Plans.

a. Background

Five forest wildlife species and one group were selected as Management Indicator Species (MIS), as detailed in the 1990 Rogue River Land and Resource Management Plan. Indicator species were intended to serve as habitat surrogates used to suggest qualitatively the condition of the habitat they represent.

Black-tailed deer and **Roosevelt elk** habitat will be managed to provide adequate forage, hiding cover, and thermal cover conditions throughout summer and winter range. Three species represent mature and old-growth forest habitat conditions: **pine marten**, **pileated woodpecker**, and **spotted owl**. Habitat for **woodpeckers** (besides pileated) is managed based on land allocations.

The 1989 Siskiyou NF LRMP identified eight management indicator species. These include the **bald eagle** (habitat along major rivers), **osprey** (habitat along large rivers), **spotted owl** (old-growth forest), **pileated woodpecker** (mature forest), **pine marten** (mature forest), **black-tailed deer** (early forest successional stages), **Roosevelt elk**, (early forest successional stages), and **woodpeckers** (wildlife trees or snags).

Species background and accounts for MIS species are contained in Appendix C to this EIS, incorporated by reference.

b. Effects Mechanisms and Analysis Framework

See the assumption discussion at the beginning of Chapter III for a general list of assumptions used in this analysis.

Black-tailed Deer and Roosevelt Elk

Deer and elk are likely to be affected by the following road or motorized trail-associated factors: collisions, hunting, poaching, displacement or avoidance, disturbance at a specific site (Gaines et al. 2003).

Mortality from vehicle collisions on highways and other surfaced roads is often substantial, but collisions on native surface routes with lower speeds and traffic volumes, such as the routes that are being evaluated in this project, is probably slight.

Greater human access can increase opportunities for hunting as well as poaching of deer and elk. Since hunting levels for deer are controlled through tag limits established by Oregon Department of Fish and Wildlife, an increase in hunting opportunity or hunter success is unlikely to impact deer populations (deVoss et al. 2003). Hunting limits also take into account estimates of the amount of illegal kill and road kill occurring.

In general, studies show that deer and elk will move away from, or flush, from an approaching person and will usually allow a person in or on a vehicle to get closer than a person on foot (Freddy et al. 1986, Wisdom et al. 2005).

In northeast Oregon, movement rates and flight responses in deer were not as substantial as in elk; however deer tended to seek dense cover when disturbed, which may reduce forage opportunities and a reduction in opportunities to put on needed fat for winter. Wisdom et al. found that mule deer showed little measurable flight response to experimental OHV treatments but cautioned that deer may well be responding with fine-scale changes in habitat use (i.e. avoidance), rather than substantial increases in movement rates and flight responses. Several studies have found that deer avoid areas in proximity to roads.

Road density can also have adverse effects on deer. These include loss of habitat, increased harvest from both legal and illegal hunting, and vectors for invasive/non-native species. High road densities and the associated traffic have been shown to decrease habitat quality and increase vulnerability for deer. During winter, when big-game species are on winter ranges, forage availability and value is generally low due to senescence of grasses and forbs. During this period open roads and the associated traffic have even greater detrimental effects on big-game due to their inability to escape harassment (disturbance) and both legal and illegal hunting pressure due to deep snow.

Elk experience higher levels of stress when exposed to increased road density. Physiological indicators of stress, such as fecal glucocorticoids, have been observed in elk exposed to increased road density and traffic on roads (Millspaugh et al. 2001). Energetic costs of moving away from disturbance associated with roads may be substantial (Cole et al. 1997). During periods of deep snow, disturbance associated with roads likely increases energetic costs even more. In elk, if body fat is reduced below 9% as animals enter the winter period, the probability of surviving the winter is reduced (Cook et al. 2004).

American Marten

Motorized routes can impact marten in a number of ways. Gaines et al. (2003) found marten likely to be affected by the following road and motorized trail-associated factors: collisions, displacement or avoidance, habitat loss or fragmentation, snag reduction, down log reduction, edge effects, and movement barrier or filter.

Buskirk and Ruggiero (1994) identified collisions with motor vehicles as a source of marten mortality. However, collisions are much less likely to occur along the slower-speed native surface routes that are being evaluated in this project.

Robitaille and Aubrey (2000), studying marten in an area of low road density and traffic (primarily logging roads), found that marten use of habitat within 300 and 400 meters of roads was significantly less than habitat use at 700 or 800 meters distance. Although marten were detected in proximity to roads in their study, significantly less activity occurred within these zones.

Martens are known to be sensitive to changes in overhead cover, such as can result from roads or trails (Hargis and McCullough 1984, Buskirk and Ruggiero 1994). Roads and trails can fragment habitat, and could thus affect the ability of marten to use otherwise suitable habitat on either side of the route.

High levels of coarse woody debris (snags, downed logs, root masses, large branches) is an essential component of marten habitat, especially during the winter months when marten require such structures for cover and hunting opportunities under the snow.

In addition, large logs with cavities provide rest and den sites for marten. Activities that remove coarse woody debris are therefore likely to degrade marten habitat (Buskirk and Ruggiero 1994). Hazard tree removal along roads will reduce numbers of snags and, in turn, down logs within a distance of about 60 meters alongside roads. Motorized routes provide access to woodcutters, also reducing amounts of down wood within roadside corridors. These effects within 60 meters of roads may, however, be incidental to the displacement and avoidance factors that apparently influence marten use of habitat within a greater distance of motorized routes.

Northern Spotted Owl

Refer to Terrestrial Wildlife Listed Species Issue (Section D, 9, this Chapter) for background discussion and effects mechanisms related to the northern spotted owl.

Pileated Woodpecker and Other Woodpeckers

Cavity nesting birds include the pileated woodpecker, as well as other woodpeckers. Nesting habitat for this group of MIS is provided in forested vegetation types with snags larger than 15 inches diameter. Road and motorized trail-associated factors likely to affect these species are: edge effects and the reduction of snags and down logs. Cavity nesting birds are typically more secure from nest predation than other forest birds, and recreational disturbance is not known to be a limiting factor as it is for some other forest bird species (Gaines et al. 2003).

Snag and log reduction occurs as an indirect effect of managing roads or trails for public use. Trees posing a potential human safety hazard (“hazard trees”) are removed along roads open for public use, as well as along roads receiving concentrated use during implementation of a specific project. Hazard trees are typically dead or dying trees that occur within a tree-height distance from the road. This safety policy results in a reduction in snags within a zone of about 100 to 200 feet from a road’s edge. Wisdom and Bate (2008) found that human access can have substantial effects on snag density. In their study area on the Flathead National Forest in Montana, stands adjacent to roads had snag densities three times lower than the snag densities within stands not adjacent to roads. The amount of down wood is also influenced within this zone, both by the removal of hazard trees that would become future down wood, and by the access provided for woodcutters. Down wood is important as a foraging substrate, providing insects required by species like the pileated woodpecker.

Bald Eagle and Osprey

Bald eagles could be affected by the following road and motorized trail-associated factors: displacement and avoidance, disturbance at a specific site (nest site), and reduction of snags.

Reported responses of bald eagles to human activities have included spatial avoidance of activity and reproductive failure (Anthony et al. 1995). Bald eagles seem to be more sensitive to humans afoot than to vehicular traffic (Grubb and King 1991, Hamann et al 1999). Anthony and Isaacs (1989) found that the mean productivity of bald eagle nests was negatively correlated with their proximity to main logging roads, and the most recently used nests were located in areas farther from all types of roads and recreational facilities when compared to older nests in the same territory. Nest site protection through area closures is one of the primary ways that the Forest Service and land management entities have implemented measures to avoid the potential for nest failures due to human disturbances.

c. Direct and Indirect Effects of Alternatives

Black-tailed Deer and Roosevelt Elk

Variables such as the amount and frequency of traffic, and the spatial distribution of roads in relation to deer use, influence the degree of negative effects that roads have on deer use in forested habitats (Perry and Overly 1977, Johnson et al. 2000, deVos et al. 2003). Under all alternatives, there would no change to existing levels of road density across the affected watersheds though Alternatives 3 and 4 would reduce the amount of roads and trails open to motorized traffic. However, the coupling of the diverse array of vegetative conditions with undulating terrain results in a low likelihood of deer and or elk being unable to efficiently locate and use effective security cover. Forage production, in the form of grasses – forbs – shrubs, would not be changed under any alternative.

Under **Alternative 1 and 2**, there would be no change over current conditions. Under **Alternative 3 (Proposed Action) and Alternative 4**, harassment potential would be decreased due to the reduced potential for noise and human activities through the elimination of cross country travel and the reduction in the amount of roads open to the public. In addition, Alternative 4 would reduce the miles of trails open to motorized vehicles.

Within the area covered by the 1990 RRNF LRMP, lands identified as Big Game Winter Range (MA 14) could employ seasonal restrictions to reduce impacts to big game within winter range areas as the need is identified. Although these seasonal restrictions have been employed on the High Cascades Ranger District, currently they have not been employed in all areas of Big Game Winter Range.

Northern Spotted Owl

Refer to Terrestrial Wildlife Listed Species Issue (Section D, 9, this Chapter) for background discussion and effects on northern spotted owls.

American Marten

American marten are associated with mature habitats that generally provide relatively high levels of canopy closure, large snags, and downed wood. The Forest contains high-quality late-successional habitat that appears to be suitable for marten. Surveys that are designed to detect forest carnivores have been conducted. Marten are common on the High Cascades Ranger District. Activities that remove coarse woody debris are more likely to degrade marten habitat (Buskirk and Ruggiero, 1994). Ongoing hazard tree treatment (felling) along open Forest roads will continue to reduce numbers of snags. Motorized routes provide access to woodcutters, also potentially reducing amounts of down wood within roadside corridors. These effects within 60 meters of roads may, however, be incidental to the displacement and avoidance factors that apparently influence marten use of habitat within a greater distance of motorized routes.

Under **Alternative 1 (No-Action) and Alternative 2**, there would be no change in the current condition. Areas that are within 100-200 feet of the road prism generally have reduced suitability for den and rest sites due to previous hazard tree felling and firewood removal.

Under **Alternative 3 (Proposed Action) and Alternative 4**, there is an overall decrease in the total “open” roads for vehicular and OHV traffic across the Forest. Areas that are within 100-200 feet of the road prism would continue to have reduced suitability for den and rest sites due to previous hazard tree felling.

Activities associated with project implementation such as new trail and play area construction, and conversion of Maintenance Level 1 roads to trails are likely to have the greatest potential effects on marten during the denning and early kit rearing periods because resident marten in those areas may not be habituated to the activities proposed.

However, under the Proposed Action, there is an overall decrease in the total “open” roads for vehicular and OHV traffic across the Forest. Therefore, the Proposed Action may impact individual marten, however, implementation of any of the Action Alternatives is not likely to result in a loss of viability on the planning area (Forest), nor cause a trend to Federal listing or a loss of species viability range wide. Alternative 4 would have less impact than Alternative 3 because motorized use of some trails would be prohibited.

Pileated Woodpecker and other Woodpeckers

Refer to Terrestrial Wildlife Listed Species Issue (Section D, 9, this Chapter) for background discussion and effects on woodpeckers.

There would be no change from the current level of disturbance for Pileated woodpecker and other woodpeckers under **Alternatives 1, 2, and 4**.

Effects to these woodpecker species due to disturbance could occur under the **Proposed Action**. This is due to the proposed trail construction/reconstruction and conversion of Maintenance Level 1 roads to motorized trails under this alternative. It is assumed that there would be no measurable change in the amount of use these routes currently receive. The Proposed Action may adversely impact individuals, but is not likely to result in a loss of viability nor cause a trend to Federal listing or a loss of species viability range wide because of the potential for disturbance related to traffic effects.

Because some of these roads may intersect suitable habitat for these species, overall, the **Action Alternatives** may adversely impact individuals, but is not likely to result in a loss of viability nor cause a trend to federal listing or a loss of species viability range wide because of the potential for disturbance related to traffic effects to disrupt breeding attempts or sites along previously unused travel ways.

Bald Eagle and Osprey

Bald eagles were listed as Endangered in Oregon and elsewhere by the US Fish and Wildlife Service in 1967 (USDI FWS 1967). In 1995, bald eagles were down listed to threatened status (USDI FWS 1995). The bald eagle was removed from the federal list of endangered and threatened plants and wildlife by a ruling published in the Federal Register on July 9, 2007 and effective August 8, 2007 (72 FR 37346). Bald eagles continue to be protected under the Bald and Golden Eagle Protection Act of 1940.

Bald eagle habitat on the Rogue River-Siskiyou NF is protected and managed in accordance with the Pacific Bald Eagle Recovery Plan (USDI FWS 1986), and Standards and Guidelines 4-3 and 4-4 of the Siskiyou National Forest Land and Resource Management Plan (USDA 1989). As part of the recovery plan, key nesting habitat areas have been identified on the Rogue River-Siskiyou NF along the Rogue, Illinois, and Sixes Rivers (USDI FWS 1986).

Osprey are closely associated with open water (lakes, rivers, and streams). It breeds in the Forest’s major habitat types but only when adjoining open water. Osprey are regularly observed along the major rivers across the Forest.

Motorized use does not typically occur in proximity to large open water or major rivers. Motorized use designation would not impact nest trees. Bald eagles and osprey are often seen in proximity to human inhabited areas and impacts from disturbance are not anticipated. As such, no adverse impact is expected. No further discussion is being made in this analysis.

d. Cumulative Effects

Present and foreseeable future actions that may affect MIS species or habitats on the Forest include: wildland fire, fuels treatments, livestock grazing, dam maintenance, minerals management, developed and dispersed recreation, timber harvest and vegetation treatments, reforestation, restoration, road management, and special uses. All of these activities will be designed to meet the direction provided within the Northwest Forest Plan and the local Land and Resource Management Plans (i.e., Forest Plans), and in accord with Aquatic Conservation Strategy objectives (NWFP 1994, Rogue River NF LRMP 1990, and Siskiyou NF LRMP 1989).

None of the alternatives would result in substantial direct or indirect adverse effects to MIS species. Thus, implementation of the project is not expected to result in detrimental cumulative effects to wildlife MIS species or habitat.

All routes that are being considered for designation within the alternatives of this project currently exist and are receiving some amount of use. Further, it is assumed that because of this existing use, regardless of which alternative is selected, detrimental effects to terrestrial wildlife MIS habitat and populations from the motorized route network would either be reduced or maintained when compared to the current condition.

11. Other Special or Rare and Uncommon Terrestrial Wildlife

Will motorized vehicle use designation affect other special or rare and uncommon terrestrial wildlife species or neotropical birds?

Special species considered rare and uncommon include flammulated owl, great gray owl, pygmy nuthatch, and Oregon red tree vole, and habitat for neotropical migratory birds.

a. Background

Rare and Uncommon Species

- Flammulated owl (*Otus flammeolus*)
- Great gray owl (*Strix nebulosa*)
- Pygmy nuthatch (*Sitta pygmaea*)
- Oregon Red Tree Vole (*Arborimus longicaudus*)

Neotropical Migratory Birds

Vaux's swift, pileated woodpecker, Brown creeper; red crossbill; varied thrush, Hermit warbler; Hammond's flycatcher; Pacific-slope flycatcher; Wilson's warbler; winter wren, Black-throated gray warbler, Hutton's vireo, Olive-sided flycatcher; western bluebird; orange-crowned warbler; rufous hummingbird, Band-tailed pigeon, California quail, western screech-owl, Nuttall's woodpecker, oak titmouse, wrentit, California thrasher, black-chinned sparrow

Species background and accounts for rare and uncommon terrestrial wildlife species and neotropical birds are contained in Appendix C to this EIS, incorporated by reference.

b. Direct and Indirect Effects of Alternatives

Flammulated Owl

This species is closely associated with the mixed forest habitat type but it requires ponderosa pine in its habitat. This species is closely associated with multi-story, moderate-closed canopy structural conditions. There would be no effect to canopies of mixed or ponderosa pine forests or habitat under any alternative. Due to the potential of disturbance to nesting owls from noise associated with passenger vehicle and OHV traffic, all alternatives may impact but not adversely impact this species.

Great Gray Owl

The range for this species includes the Forest and there are several documented locations, primarily on the High Cascade Ranger District and two locations on the Siskiyou Mountains Ranger District. Due to the potential of disturbance to nesting owls from noise associated with passenger vehicle and OHV traffic, all alternatives may impact but not adversely impact this species.

Pygmy Nuthatch

This species is associated with the Forest's habitat types and is considered to require ponderosa pine as a habitat component. This species is present within the Forest. Due to the potential of disturbance to the nuthatch from noise associated with passenger vehicle and OHV traffic, all alternatives may impact but not adversely impact this species.

Oregon Red Tree Vole

The Oregon red tree vole is a nocturnal, arboreal mammal specialized in feeding on needles of Douglas-fir and other coniferous trees (Maser 1998). The species is endemic to western Oregon (Verts 1998) primarily in coniferous forests of western Oregon (Csuti et al. 1997, Maser 1998). There would be no effect to Douglas-fir forests or vole habitat under any alternative. Due to the potential of disturbance to voles from noise associated with passenger vehicle and OHV traffic, all alternatives may impact but not adversely impact this species.

Neotropical Migratory Birds (Landbirds)

Effects to landbirds are variable depending on the habitat associations of the individual species and effects to habitats previously described (see EIS Appendix C). There would be no effect to forested conditions under any alternative.

OHV trail development could create possible adverse impacts on nesting success and abundance of breeding bird via disturbance. Areas within 100 meters of OHV trails may provide reduced-quality habitat to nesting songbirds, particularly for species that suffer substantial losses of annual fecundity due to abandonment or desertion of individual breeding attempts. Limitation of OHV trail development in breeding areas of rare or endangered birds could minimize conflicts over land use between recreation and wildlife conservation.

In those areas with reductions in open roads or trails, a beneficial effect on landbird breeding and nesting can be expected. The converse would be true in those areas where Maintenance Level 1 roads are opened to OHV use, in any area with new trails or play areas, and in areas where mixed use is proposed due to increases in traffic, although effects would likely be reduced in areas with already open roads. Due to the potential of disturbance to voles from noise associated with passenger vehicle and OHV traffic, all alternatives may impact but not adversely impact this species.

c. Cumulative Effects

Present and foreseeable future actions that may affect special or rare and uncommon terrestrial wildlife species or habitats on the Forest include: wildland fire, fuels treatments, livestock grazing, dam maintenance, minerals management, developed and dispersed recreation, timber harvest and vegetation treatments, reforestation, restoration, road management, and special uses. All of these activities will be designed to meet the direction provided within the Northwest Forest Plan and the local Land and Resource Management Plans (i.e., Forest Plans), and in accord with Aquatic Conservation Strategy objectives (NWFP 1994, Rogue River NF LRMP 1990, and Siskiyou NF LRMP 1989).

None of the alternatives would result in substantial direct or indirect adverse effects to special or rare and uncommon terrestrial wildlife species or habitats. Thus, implementation of the project is not expected to result in detrimental cumulative effects.

All routes that are being considered for designation within the alternatives of this project currently exist and are receiving some amount of use. Further, it is assumed that because of this existing use, regardless of which alternative is selected, detrimental effects to special or rare and uncommon terrestrial wildlife species or habitats from the motorized route network would either be reduced or maintained when compared to the current condition.

12. Fisheries and Aquatic Species

Will motorized vehicle use affect fish (native and anadromous) or other aquatic species?

A Biological Evaluation of the Action Alternatives was conducted to evaluate potential effects on fish species listed under the Federal Endangered Species Act, Forest Service Sensitive fish species, and on other native fish species; all information and findings are included within this Draft EIS.

a. Background

The Rogue River-Siskiyou National Forest provides a diverse array of aquatic habitats for many species of fish. There are over 2,000 miles of fish bearing stream habitat on the forest, of which approximately 1,200 miles support anadromous fish populations. Present native salmonids include: coho salmon, Chinook salmon, steelhead, rainbow trout, and cutthroat trout.

The Forest contains portions of six designated Wild and Scenic Rivers, including the: upper Rogue, lower Rogue, Chetco, Illinois, Elk, and North Fork Smith Rivers; all of which have fisheries Outstanding and Remarkable Values. Lake habitat is also abundant on the Forest, particularly within the Sky Lakes and Red Buttes Wilderness Areas, where many high elevation lakes are stocked with trout.

At the landscape scale, it is well documented that motorized routes can modify the frequency, timing, and magnitude of disturbance to aquatic systems. The current motorized travel system on the Forest includes over 5,800 miles of motorized routes. Many of these routes are located within proximity to occupied fish habitat. The overriding adverse effect of this motorized travel system on the fisheries resource is via sediment input to stream systems, and to a lesser degree fragmentation of aquatic habitats due to impassable road/stream crossings. These conditions have contributed to decreased distribution and abundance of native salmonid stocks, particularly anadromous salmon and steelhead.

This project involves the identification of a motorized travel system for the Forest. Following completion of the MVUM, motorized travel on the Forest would be restricted to designated routes and areas only. In general, this project is merely designating permitted vehicle use on the existing system of routes within the Forest. Accordingly, the baseline (i.e., pre-project) condition includes all adverse impacts to aquatic biota populations and habitat from this existing route network. These magnitude and extent of road and trail impacts to fish population and fisheries habitat is highly variable depending on site specific characteristics. General effects of roads and trails on the fisheries resource are described below.

b. Effects Mechanisms and Analysis Framework

Roads, particularly those located in proximity to riparian areas; pose a distinct threat to aquatic biota habitat quality and population structure (Gucinski et al. 2001, Furniss et al. 1991). Roads can route sediment into water bodies, fragment aquatic habitat (i.e., migration barriers), and provide a vector for introduction of aquatic nuisance species and hazardous materials (Trombulak and Frissell 2000). Additionally, roads provide access to and concentrate human and livestock use within riparian areas. This can lead to widespread degradation of stream banks, in-channel aquatic habitat, and riparian vegetation.

Under any of the alternatives, roads and motorized trails (routes) would be identified for use within watersheds that support fish populations and other aquatic biota. Some of these routes are located within Riparian Reserves, and thus have a high likelihood of producing adverse impacts to both aquatic biota populations and habitat. Riparian Reserves on the Rogue River-Siskiyou National Forest were designated under the Northwest Forest Plan (1994).

General effects related to roads and motorized trails located within Riparian Reserves are detailed in Figure D- 1, 2, and 3, EIS Appendix D (Hydrology Section). Information displayed in these diagrams is supported by Gucinski et al. 2001, Waters 1995, Furniss et al. 1991, Hausle and Coble 1976, and Cordone and Kelley 1961. It should be noted that none of the alternatives would result in measurable increases from road and motorized trail related impacts to aquatic habitat beyond what is currently occurring.

c. Direct and Indirect Effects

Under **Alternative 1 – No Action**, the current motorized route system would remain on the landscape and vehicle use designations would not change. Consequently, current effects to the fisheries resource from the motorized route system would persist. These effects are described in general terms above within the “Background” section. Site specific effects from individual routes or groups of routes do vary in magnitude and scope across the Forest.

Adverse effects to aquatic systems from roads are well documented at the landscape scale, but can be difficult to quantify at a site specific scale. Common landscape scale effects include: sediment influx into stream channels, migration barriers due to improperly designed road-stream crossings, water temperature increases, and altered stream flow regimes (Gucinski et al. 2001).

Alternative 2 was developed to meet the intent of the Travel Management Rule (36 CFR Part 212), with minimal alterations to the current motorized use on the Forest. As such, the effects to the fisheries resource are identical to those disclosed within Alternative 1.

This alternative would permit the development of increasing networks of user-created routes within areas (approximately 275,000 acres) open to cross-country travel. Depending on slope, terrain, and vegetation, the actual amount of these open travel areas that may receive motorized use varies. That is, in some sub-watersheds with gentle terrain and open vegetation, motorized vehicles (primarily OHVs) may be able to travel across a large percentage of the area. This can lead to higher rates of erosion across broad areas, but may also diffuse impacts.

In other sub-watersheds with steep terrain and dense vegetation, OHV use is often physically restricted to major ridgetops and drainage bottoms. Ridgetop use would generally be far enough away from streams to reduce sedimentation, but drainage bottom use can affect aquatic biota due to the direct proximity to streams and lakes, with damage including sedimentation, and stream bank and riparian vegetation alteration.

This alternative also provides for parking up to 300 feet off of open roads, to facilitate dispersed recreation activities. Dispersed recreation is a common activity across the Forest that can result in detrimental impacts to adjacent aquatic habitats. These effects may include increased sediment influx into water bodies from bank damage and user-created crossings, reduced riparian plant composition and structure, and increased risk of aquatic nuisance species transfer and introduction (Gucinski et al. 2001). Each of these effects has the potential to reduce fisheries habitat condition and population structure at the site scale.

Alternative 3 (Proposed Action) includes changes to the existing motorized route designations within 21 5th field watersheds on the Forest.

One of the key benefits to fish populations and habitat under this alternative is the elimination of motorized cross-country travel on the Forest. This action should limit current and future expansion and creation of unauthorized routes, thus, limiting potential degradation of high value aquatic habitats.

Under this alternative, off-road parking would be allowed up to 300 feet off of designated routes to facilitate dispersed recreation. Effects to the fisheries resource from this provision are disclosed above within the Alternative 2 effects discussion.

The following discussion presents effects by specific Ranger Districts, with a focus on the action element as associated with the Proposed Action (in italics).

Powers Ranger District

Watersheds with proposed activities are included in Table III-11.

Table III-11. Watersheds with Proposed Activities – Powers Ranger District

Watershed	5 th field Watershed HUC #	Proposed Activity	Fish Species in Proximity
Elk River	1710030602	Eliminate Motorized use on roads within proposed Copper Salmon Wilderness Area	Coastal cutthroat trout, coho salmon, Chinook salmon, steelhead
South Fork Coquille River	1710030501	Eliminate motorized use on trail within proposed Copper Salmon Wilderness Area, Designate mixed use on a portion of the paved Eden Valley Road	Coastal cutthroat trout, coho salmon, Chinook salmon, steelhead, rainbow trout
West Fork Cow Creek	1710030208	Designate mixed use on a portion of the paved Eden Valley Road	Coastal cutthroat trout, coho salmon, steelhead, rainbow trout

Close trails to motorized use.

Close roads to public use.

No measurable effect to fish populations or fisheries habitat within the Elk River watershed (5th Field HUC 1710030602) or South Fork Coquille River watershed (5th Field HUC 1710030501), due to road prism and drainage structures remaining on the landscape. Consequently, sediment production and altered drainage patterns would persist. Any benefit derived from elimination of traffic on these routes would be imperceptible at the watershed scale.

Designate paved road for mixed use.

No effect to fish populations or fisheries habitat, due to no change to the existing road network. The proposed activity would merely redefine the type of vehicle that is permitted to drive on Forest Road 3348 (Eden Valley Road).

Gold Beach Ranger District

Watersheds with proposed activities are included on the following table:

Table III-12. Watersheds with Proposed Activities – Gold Beach Ranger District

Watershed	5 th field Watershed HUC #	Proposed Activity	Fish Species in Proximity
Lower Rogue River	1710031008	Convert Maintenance Level 1 road(s) to motorized trail, construct motorized trail	Coastal cutthroat trout, coho salmon, Chinook salmon, steelhead, rainbow trout
Hunter Creek	1710031205	Convert Maintenance Level 1 road(s) to motorized trail	Coastal cutthroat trout, rainbow trout
Illinois River-Lawson Creek	1710031111	Convert Maintenance Level 1 road(s) to motorized trail, eliminate motorized use on a trail	Coastal cutthroat trout, coho salmon, Chinook salmon, steelhead, rainbow trout
Illinois River-Klondike	1710031108	Convert Maintenance Level 1 road(s) to	Coastal cutthroat trout, coho

Watershed	5 th field Watershed HUC #	Proposed Activity	Fish Species in Proximity
Creek		motorized trail	salmon, Chinook salmon, steelhead, rainbow trout
Chetco River	1710031201	Eliminate mixed use on a portion of the road system	Coastal cutthroat trout, coho salmon, Chinook salmon, steelhead, rainbow trout

Convert Maintenance Level 1 roads to motorized trails.

This action is located within 4 watersheds (Lower Rogue River 1710031008, Hunter Creek 1710031205, Illinois River-Lawson Creek 1710031111, and Illinois River-Klondike Creek 1710031108). Within the Lower Rogue River, Hunter Creek, and Illinois River-Klondike Creek watersheds, measurable effects to fish populations or fisheries habitat from this action are not expected, due to the affected routes not occurring in proximity to occupied fish habitat.

Within the Illinois River-Lawson Creek watershed, the affected route is located in proximity to the Lawson Creek headwaters, an area that contains self-sustaining populations of rainbow trout and cutthroat trout. There is potential for localized increases in sedimentation to Lawson Creek, as a result of the conversion from Maintenance Level 1 to motorized trail. Increased sedimentation can result in the loss of habitat for both aquatic macroinvertebrates and fish, through the elimination of the interstitial spaces in the streambed and the filling of pools. Sedimentation can also adversely affect the spawning success of salmonids, by impeding the process of excavating a redd, depleting oxygen flow to the eggs and sac fry, and blocking the passage of emerging sac fry (Waters 1995). These effects can further lead to decreased abundance, diversity, and species composition within the affected stream reach. At the watershed scale, these localized adverse effects would not result in measurable deleterious effects to the Lawson Creek fisheries resource.

Construct new motorized trail.

This action would occur within the Lower Rogue River watershed, west of Quosatana Creek. No measurable effect to fish populations or fisheries habitat is expected due to location of the of the proposed route construction (~0.75 mile from occupied resident native trout habitat), and the existing road nature of the watershed.

Prohibit mixed use on roads that allow mixed use.

No effect to the fisheries resource would occur as the current route network would be maintained in its existing condition, with street legal motorized use continuing.

Close trails to motorized use.

The action would result in slight beneficial effects to effect to the fisheries resource within Lawson Creek and lower Illinois River. These effects are primarily related to the elimination of motorized low water crossings (i.e. fords) on the streams, which should reduce sediment production and potential for petroleum based chemical impacts to water quality. However, given the size of the associated watershed and other motorized travel activities occurring within it, these beneficial effects are likely to be immeasurable at the watershed scale.

Wild Rivers Ranger District

Watersheds with proposed activities are included on the following table:

Table III-13. Watersheds with Proposed Activities – Wild Rivers Ranger District

Watershed	5th field Watershed HUC #	Proposed Activity	Fish Species in Proximity
Silver Creek	1710031109	Eliminate motorized use on trail(s)	Coastal cutthroat trout, Chinook salmon, steelhead, rainbow trout
Briggs Creek	1710031107	Eliminate motorized use on trail(s)	Coastal cutthroat trout, coho salmon, steelhead, rainbow trout
Rogue River-Hellgate	1710031001	Convert Maintenance Level 1 road(s) to motorized trail	Coastal cutthroat trout, rainbow trout
Illinois River-Josephine Creek	1710031106	Eliminate mixed use on a portion of the road system, close portion of road system to public use	Coastal cutthroat trout, coho salmon, Chinook salmon, steelhead, rainbow trout
Deer Creek	1710031105	Close portion of road system to public use	Coastal cutthroat trout, coho salmon, Chinook salmon, steelhead, rainbow trout
North Fork Smith River	1801010101	Convert Maintenance Level 1 road(s) to motorized trail	Coastal cutthroat trout, coho salmon, Chinook salmon, steelhead, rainbow trout
West Fork Illinois River	1710031104	Close portion of road system to public use	Coastal cutthroat trout, coho salmon, Chinook salmon, steelhead, rainbow trout
Sucker Creek	1710031103	Eliminate motorized use on trail(s)	Coastal cutthroat trout, coho salmon, Chinook salmon, steelhead, rainbow trout
Indian Creek	1801020902	Eliminate motorized use on trail(s)	

Close roads to public use.

No effect to the fisheries resource would occur as the current route network would be maintained in its existing condition, with administrative and limited permitted use continuing.

Prohibit mixed use on roads that allow mixed use.

No effect to the fisheries resource would occur as the current route network would be maintained in its existing condition, with street legal motorized use continuing.

Convert Maintenance Level 1 roads to motorized trails.

The affected road segments are located along ridgelines away from fisheries habitat. Consequently, no measurable effect to the fisheries resource is expected or likely.

Close trails to motorized use.

This action has the potential to reduce erosion along the affected trails, which could result in reduced sediment influx into the adjacent stream systems. This reduction in sediment production and influx would result in localized beneficial impacts to fisheries habitat.

In general, the affected trail segments are located upstream of the anadromous fish distribution, in areas occupied by native resident trout.

Given the current roaded nature of the affected watersheds, measurable effects to the fisheries resource are not expected at the watershed scale. However, it is expected that localized reductions in sediment influx into stream systems could improve fish habitat within the affected stream segments. These effects are most likely to manifest themselves near the low water crossings on Swede Creek and Horse Creek, both of which are tributaries to Briggs Creek.

Siskiyou Mountains Ranger District

Watersheds with proposed activities are included on the following table:

Table III-14. Watersheds with Proposed Activities – Powers Ranger District

Watershed	5th field Watershed HUC #	Proposed Activity	Fish Species in Proximity
Upper Applegate River	1710030901	Eliminate motorized use on trail(s), construct motorized trail	Coastal cutthroat trout, rainbow trout, brook trout

Close trails to motorized use.

This trail is located near Echo Lake, which supports a self-sustaining population of brook trout. However, given the steep terrain and exposure that the trail travels through, motorized use is low and adverse impacts to the Echo Lake fishery are not currently evident or expected with the implementation of the Proposed Action.

Construct new motorized trail.

The proposed location for this new trail segment is within the Squaw Creek subwatershed (6th field HUC 1701003090108), but is not located within the riparian zone. Given the current roaded condition of the subwatershed (3.97mi/mi²) and upland location of the proposed construction, measurable effects to the fisheries resource would not occur.

High Cascades Ranger District

Watersheds with proposed activities are included on the following table:

Table III-15. Watersheds with Proposed Activities – High Cascades Ranger District

Watershed	5th field Watershed HUC #	Proposed Activity	Fish Species in Proximity
South Fork Rogue River	1710030702	Designate mixed use on portion of paved road system	Coastal cutthroat trout, rainbow trout, brook trout
Big Butte Creek	1710030704	Designate motorized use play area	None
Little Butte Creek	1710030708	Designate mixed use on portion of paved road system	rainbow trout, brook trout

Designate paved road for mixed use.

No effect to fish populations or fisheries habitat, due to no change to the existing road network. The proposed activity would merely redefine the type of vehicle that is permitted to drive on portions of Forest Roads 34, 37, 3705, and 3720.

Develop a motorized use play area.

The proposed play area is located on flat terrain within an existing borrow pit. There is no fisheries habitat within the immediate vicinity of the proposed site. Thus, no effects to the fisheries resource are expected or likely.

Alternative 4 was developed to provide increased protection to some sensitive areas on the Forest, while still providing for motorized access. In general, the effects to fisheries from this alternative are very similar to those disclosed under Alternative 3. However, this alternative would eliminate motorized trails within Botanical Areas, and areas with serpentine soils, which could result in localized benefits to the associated stream systems.

These beneficial impacts would mostly be tied to a potential reduction in erosion on trails that would no longer entertain motorized travel. Cross-country motorized travel would also be eliminated across the forest, with the exception of the existing Woodruff play area. Given that the current route network would remain on the landscape; no measurable effects to the fisheries resource, beyond the existing condition and trend, would occur.

Under this alternative, off-road parking would be allowed up to 300 feet off of designated routes to facilitate dispersed recreation. Effects to the fisheries resource from this provision are disclosed above within the Alternative 2 effects discussion.

d. Cumulative Effects

None of the alternatives would result in measurable direct or indirect effects to fisheries resources at the watershed or subwatershed scale. Thus, implementation of the project is not expected to result in detrimental cumulative effects to the fisheries resource.

All routes that are being considered for designation within the alternatives of this project currently exist and are receiving some amount of use. Further, it is assumed that because of this existing use, and regardless of which alternative is selected, detrimental effects to aquatic biota habitat and populations from the motorized route network would either be reduced or maintained when compared to the current condition.

Present and foreseeable future actions that may affect the fisheries resource and aquatic habitats on the Forest include: wildland fire, fuels treatments, livestock grazing, dam maintenance, minerals management, developed and dispersed recreation, timber harvest and vegetation treatments, reforestation, restoration, road management, and special uses. All of these activities will be designed to meet the direction provided within the Northwest Forest Plan and the local Land and Resource Management Plans (i.e., Forest Plans), and in accord with Aquatic Conservation Strategy objectives (NWFP 1994, Rogue River NF LRMP 1990, and Siskiyou NF LRMP 1989).

13. Visuals

Will motorized vehicle use designation affect scenic quality or affect attainment of visual quality objectives?

The scenic resources on the Rogue River-Siskiyou National Forest were inventoried under the Forest Service's Visual Management System (VMS) during the late 1970s and have been updated as specific projects were identified. This motorized vehicle use designation project is analyzed utilizing the VMS in order to maintain the integrity of the original inventory and established Visual Quality Objectives (VQOs).

a. Background

Scenic Management Guidelines

Basic inventories for developing the VQOs of an area include:

Landscape Variety Class (A = Distinctive; B = Common; and C = Minimal) is a determination of the importance of the scenic quality of the natural landscape.

Sensitivity Level (Level 1 = High; 2 = Average; and 3 = Low) is a measure of the people's concern for scenic quality.

Distance Zones is a measurement of the landscape seen from the viewing point (foreground is up to one-half mile; middleground is up to five miles; and background is to the remaining seen area).

Forested foreground scenery viewed from sensitivity level one roads and trails would be expected to exhibit a late seral character as well as a multi-storied stand of conifers. The immediate foreground should display a diversity of species and age groups including hardwoods and the shrub/groundcover layer.

Attention to details, such as minimizing ground disturbance, reducing stump heights, and managing to view large trees is necessary to maintain the sense of a natural system and the traveling public's scenic expectations. Form, lines of individual trees, and color are the dominant characteristics of the seen landscape in foregrounds.

Middleground and background areas should appear in a near natural state with openings of sizes and shapes that would reflect natural processes. Texture and lines in the landscape are important in these views (USDA 1974).

Scenic Analysis Area

Portions of the Forest are visible from several important viewpoints in and around the greater Ashland, Medford, Grants Pass, and Gold Beach areas as well as from Interstate 5, Highways 199, 62, and 140, and Forest roads and trails.

The majority of the visual land allocations as associated with the Forest Plans are to Foreground Partial Retention and Middleground Partial Retention. These areas, as seen from selected travel routes and use areas are to be managed so that, to the casual observer, results of activities are evident but are visually subordinate to the landscape. A management system is adopted which introduces some alteration of standard vegetation treatments (4-66 – 4-143, Siskiyou LRMP; 4-33 – 4-308, Rogue River LRMP).

Land management allocations on the Forest and their associated VQOs are presented in Table III-16 below. See EIS Chapter I for reference to the goal and description of the allocation, for the allocation reference number.

Table III-16. Visual Quality Objectives and Land Management Allocations

LRMP	Preservation	Retention	Partial Retention	Modification	Maximum Modification
Siskiyou	MA 1, 2, 3, 4, 5, 6, 7, 8, 9, 11	MA 10, 11, 12	MA 11, 13	MA 11, 14	---
Rogue River	MA 13, 25	MA 3, 5, 6, 8, 10, 11, 12, 15, 19, 26	MA 7, 9, 22	MA 4, 14, 16, 17, 18	MA 1, 20, 21, 23

b. Direct and Indirect Effects of Alternatives

The scenic quality of the Forest would not be directly affected by the **No Action Alternative or Alternative 2**. The existing condition would persist with no additional motorized roads, trails, or areas constructed.

The scenic quality of the Forest could slightly be directly affected by **Alternative 3 (Proposed Action)**. Approximately 2 miles of trails would be constructed. New motorized trails would include construction of a 0.5 mile connection to the Woodruff Trail (MA 14 (Siskiyou LRMP)) and relocating a small portion of the 1.2 miles of the Penn Sled Trail (MA 14, 20, 21 (Rogue River LRMP)). Both of these trails would run through Management areas that allow either Modification or Maximum Modification of visuals, thereby permitting the proposed construction and associated maintenance.

The Penn Sled Trail already exists as a historical motorized trail with trail tread in tact. Thus, direct effects would involve minor impacts related to simple maintenance. New trail construction or maintenance would involve a minimal amount of vegetation disturbance including light brushing and a limited number of conifers (less than 8 inches in diameter) removed. The Proposed Action would be compliant with the Forest’s visual Standards and Guidelines.

The scenic quality of the Forest would not be directly affected by **Alternative 4**. This alternative would not result in any new trails, roads, or areas constructed. While, 139 miles of motorized trails would not be included in the designation of this alternative, merely removing trails from use would not result in a concurrent improvement in visual or scenic quality.

The scenic quality of the Forest would be indirectly affected only by the Proposed Action. In the foreseeable future the Proposed Alternative would minimally enrich visuals by converting Maintenance Level one roads to trails. Thereby, allowing natural processes to re-establish vegetation on the roadbeds or by Forest managers actively designing a more natural, closed-in, and winding trail corridor. While Alternative 4 would remove 139 miles of trails out of motorized use, these trails would still be maintained for non motorized use and thus would visually remain consistent with the current condition.

c. Cumulative Effects

None of the alternatives would result in substantive cumulative effects. While, the Proposed Action would remove a few small diameter trees and incur a minimal amount of brushing, these actions would be insignificant and visually unnoticeable. Therefore the effects of the alternatives would not combine with past, present, or foreseeable projects to warrant an adverse cumulative effect stemming from visuals or scenic quality.

14. Sound Level

Will motorized use physically affect human hearing or affect human solitude?

In regard to sound, the identification of roads, trails, and areas for motorized use could affect the public in two main ways. First, physically, sound can have detrimental effects to human hearing, possibly leading to Noise-Induced Hearing Loss (NIHL). Second, sound can become noise and impose an unfavorable effect on recreationists seeking solitude.

a. Background

Sound is defined as a vibration in the air that can be heard and measured. Noise is defined as a sound that has characteristics that may irritate or annoy a listener, interfere with the listener's activity, or in some other way be distinguished as unwanted (Harrison 1980).

Sound Laws

The US Environmental Protection Agency (EPA) adopted federal sound limits for new off-highway motorcycles, except competition machines, and three-wheeled ATVs beginning with the 1983 model year (Subpart D of 40 CFR 205.152). Sound limits are currently 80 decibels (dB) for vehicles displacing less than 170cc and 82 dB for those over 170cc, based on a precise, engineering acceleration test measured from a pass by assessment at a distance of 50 feet. Four-wheeled OHVs, however, are not regulated by the EPA noise standards because these products were not manufactured when the EPA regulations were promulgated.

To provide assurance that these products also comply with the EPA sound limits, the major manufactures and the American National Standards Institute (ANSI) developed a voluntary standard (ANSI/SVIA-1-2001) that recommends to the EPA off-highway motorcycle sound limits for four-wheeled OHVs. The EPA Office of Noise Abatement and Control was eliminated shortly after the EPA adopted the motorcycle noise regulations, however manufactures are still required by federal law to certify their products or pay heavy fines (MSWG 2005).

To address the need for an in-use enforcement tool, the Motorcycle Industry Council (MIC) worked with the Society of Automotive Engineers (SAE) to develop quick, easy, and economical stationary sound test procedures. Stationary sound test procedures for determining excessively loud off-highway motorcycles and OHVs are now widely used by nine states, including Oregon (MSWG 2005).

Table III-17. Oregon Vehicle Standards: Allowable Noise Limits

Vehicle	Model Year	Stationary: Maximum Noise Level at 20 inches	Moving: Maximum Noise at 50 feet
Motorcycles	Pre 1975	102 dB	85
Motorcycles	After 1975	99 dB	82
Front Engine (SUV, Truck, Car)	All	95 dB	78
Mid & Rear Engine (quad, sandrail)	All	97 dB	78

(OAR 2008) & (OPRD 2008)

b. Effects Mechanisms and Analysis Framework

Sounds from motor vehicles can have detrimental effects to human hearing. Sounds that are too loud or loud sounds that last a long time can result in damage to the inner ear causing NIHL. Sensitive hair structures, called hair cells, are small sensory cells that convert sound energy into electrical signals that travel to the brain. Once damaged, hair cells cannot grow back (NIDCD 2008).

NIHL can be caused by a one-time exposure to an intense “impulse” sound, such as the crack of a motorcycle revving up, or by continuous exposure to loud sounds over an extended period of time. The loudness of sound is measured in units called decibels. Sources of sound emitting from 120 to 150 decibels can cause NIHL. Long or repeated exposure to sound at or above 85 decibels can also cause hearing loss. The louder the sound, the shorter the time period before NIHL can occur. Some sounds are so loud (140+ decibels), any exposure to them at close range can cause permanent damage and hearing loss. Sounds of less than 75 decibels, even after a long exposure, are unlikely to cause hearing loss. Distance from the sound is equally important as the duration. Table III-18 shows the accepted standards for recommended permissible exposure times for continuous average noise before possible damage to human hearing can occur (NICD 2008).

Table III-18. Human Decibel Exposure Time Guidelines

Continuous decibels (dB)	Permissible Exposure Time
85	8 hours
91	2 hours
97	30 minutes
100	15 minutes
106	< 4 minutes
109	< 2 minutes
112	< 1 minute
115	< 30 seconds

Sounds can result in immediate hearing loss and be accompanied by tinnitus or the ringing, buzzing, or roaring of ears or head. These symptoms can subside over time. Hearing loss and tinnitus may be experienced in one or both ears, and tinnitus may continue constantly or occasionally throughout a lifetime. NIHL from both impulse and continuous sounds can be prevented by regularly using hearing protection such as earplugs, earmuffs, or riding helmets. (NIDCD 2008).

Sounds from motor vehicles can also have detrimental effects on non-motorized recreation users and those seeking solitude, especially on trails. Sound levels or loudness are not good predictors of annoyance because some sounds are considered intrusive even at low levels. According to Herbert Kariel, studies show that it is a combination of the physical characteristics of sounds themselves and their socio-psychological aspects which determines their evaluation as pleasing, annoying, or acceptable.

Socio-psychological aspects of sounds are those that deal with their interpretation and the effect of sound on the individual. When a sound is heard, people interpret, evaluate, and attach meaning and significance to it. People judge its appropriateness for the setting, whether it is potentially harmful or helpful, and how it relates to past experience. Sounds which are interpreted as aiding or benefiting an activity are evaluated positively, while those deemed as interfering with or being detrimental to an activity are considered displeasing or annoying.

In addition, sounds over which people feel they have no control or which are unpredictable, are considered annoying. Sounds such as motorized vehicles, deemed as annoying by many non-motorized users (hikers), distract from the quality of the recreational experience. Conflict frequently arises between those who wish to enjoy and preserve quiet areas, where natural sounds predominate, and those whom wish to use mechanized equipment in such environments (Kariel 1990). On the RRSNF, user conflicts have been documented most noticeably on the Boundary Trail, and to a lesser extent, on other trails where motorized use (primarily motorcycles) is allowed.

c. Direct and Indirect Effects of Alternatives

Physical Effects of Sound

Direct effects associated with the Action Alternatives would be negligible. Motorcycles possess the loudest legal decibel (82 dB) of all vehicles included in Table III-17 at a distance of 50 feet. 85 dB being the threshold at which prolonged exposure greater than eight hours could result in hearing loss without the use of hearing protection. Thus, a person would have to stand no further than 50 ft. from a motorcycle for longer than eight hours to be at risk. At a closer distance of 20 inches, such as when a motorcycle passes a hiker on a trail, the hiker could experience legal sound levels of 102 dB. At this distance, the hiker would have to remain at no further than 20 inches from the motorcycle for more than 10 minutes to risk NIHL. Users, such as hikers, typically experience only a few minutes at most of decibels over 85 as vehicles pass them on roads or trails. Therefore, their risk of hearing damage is minute.

Those whom are at the greatest risk of loud sounds above 85 dBs are the riders/drivers themselves as all vehicles in Table III-17 at a distance of 20 inches are above the 85 dB threshold. The Forest recognizes that the rider/driver of some vehicles may be more than 20 inches from the engine due to the design of the vehicle and thus be at less risk.

Wearing a helmet is Oregon law for all riders under the age of 18; observations by Forest Staff indicate that wearing helmets is the norm across the Forest, thus protecting riders from harmful sounds.

There are no foreseeable consequences that occur later in time or farther removed in distance from the point of a sound's origin. Therefore, there are no indirect effects of the alternatives in regards to physical sound. While users at a different location may hear vehicle use off in the distance, no physical damage stemming from the sound from a motor vehicle is foreseeable.

Social Effects of Sound

The direct effects of the **No Action Alternative** and **Alternative 2** would neither exacerbate nor improve the current user conflict stemming from sound related annoyance and social impacts of motor vehicle use. These alternatives would continue to allow cross-country travel of motor vehicles on 275,000 acres and on 253 trail miles, perpetuating the annoyance and interference of solitude for non-motorized users. The same number of miles of roads and trails would exist across the forest and thus have no effect or change over present conditions.

Direct effects of the **Alternative 3 (Proposed Action)** would slightly reduce user conflicts and social impacts related to what some consider the annoying sound of motor vehicles. Under this alternative, cross-country travel would be limited to two designated off-highway vehicle play areas. Total miles of open road would decrease by 31 miles. Total motorized trail mileage would decrease by approximately 10 miles. Thus, while the addition and subtraction of road and trail miles would be relatively insignificant, cross-country travel would be eliminated from 275,000 acres outside of the play areas, resulting in a potential reduction of annoying sounds and user conflicts between motorized and non-motorized users. User conflicts would continue to occur on most motorized trails, including the Boundary Trail. These conflicts would cease on the Bigelow Lake Trail, (which connects to Boundary), and on other trails located across the Forest (see Chapter II, District Specific Elements of Alternative 3).

The direct effects of **Alternative 4** are similar to the Proposed Action for road closures. However, this alternative proposes to close 139 miles of trails currently open to motorized use. Thus, it would have a potentially greater effect than the Proposed Action on reducing conflicts stemming from the noise associated with motorized vehicle use between motorized and non-motorized trail users. The entire Boundary Trail system, a large portion of the Briggs Valley system, and a number of other trails would be closed to motorized use (see Chapter II, District Specific Elements of Alternative 4). Alternative 4 represents the highest potential for solitude (for non-motorized users) of all alternatives.⁹

Total trail mileage on the Forest is 1,194 miles. Of that total, 253 miles would be motorized in Alternatives 1 and 2, 194 miles in Alternative 3, and 114 miles in Alternative 4. All alternatives provide opportunities for solitude on a high number of Forest trails.

The indirect effects of the **No Action Alternative** and **Alternative 2** would likely result in some non-motorized users choosing to no longer recreate in areas where annoying sounds from motor vehicles persist. Non-motorized users would likely be displaced and begin to concentrate in areas where vehicles could not be heard.

⁹ It is important to note that many motorized users are seeking many of the same experiences as non-motorized users. For example, a motorcyclist may ride to a remote area, turn off the engine, and camp for a quiet night of solitude.

The indirect effects of the **Alternative 3 and Alternative 4** would increase the likelihood of non-motorized users finding areas devoid of motor vehicle noise. Utilizing the MVUM, which outlines motorized roads, trails, and areas, non-motorized users would have the ability to predict areas where sounds from motor vehicles could be avoided and where solitude could be found across the Forest. Therefore these alternatives increase the ability of non-motorized users to find areas where noise from motorized use would not distract from their pursuit of a quality recreational experience and thereby reduce user conflicts with motorized user groups.

d. Cumulative Effects

Physical sound from motor vehicle operation across the forest, combined with sounds of hikers, campers, aircraft overflights, logging operations, and various management activities could cumulatively add to the impacts of physical sound and/or noise. The difference in cumulative impacts between alternatives cannot be quantified, but does not appear to be substantially different. The Action Alternatives are not likely to create adverse cumulative noise effects considering this and other current and foreseeable activities.

15. Enforcement

Will proposed actions affect the agencies ability to enforce public compliance with laws?

The Forest Service is responsible for enforcing the Code of Federal Regulations (CFRs) at 36 CFR 261 that applies to the RRSNF. The approximately 1.8 million acres of the Forest provide many challenges to law enforcement officials, ranging from minor infractions such as littering to serious situations like theft of timber, assaults, and drug-related incidents. Managing increased recreation use and related law enforcement issues proves to be a challenging and issue on the Forest.

a. Background

The Forest Service has several methods of enforcing compliance with the regulations applicable to the RRSNF. Forest Protection Officers (FPOs) are the primary personnel involved in enforcing regulation compliance. Forest Service law enforcement officers (LEOs), or Sheriff's office personnel, commonly handle more dangerous violations such as disorderly conduct. The RRSNF currently has approximately 25 FPOs who can write warnings and citations as necessary to solicit compliance. The RRSNF also has six assigned field LEO positions, plus one LE supervisor/program manager.

FPOs typically handle the most common violations. These include violations such as parking improperly, failure to pay fees, pets off of a leash, length of stay, improper motor vehicle use, and camping related offenses. In most cases, the public complies with the requests from FPOs and no citation is issued. FPOs are also typically responsible for installing and maintaining signs, information boards, barriers and physical closures, and providing information about rules and regulations. Many FPOs work seasonally, primarily during the summer, high use season.

LEOs typically issue warnings and citations for all of the above violations as well as for operating a motor vehicle in violation of federal regulations and Oregon vehicle codes. LEOs investigate and cite for cases of damaging or disturbing soils, vegetation, or wildlife as well as dealing with more serious crimes that can occur on the Forest. LEOs also commonly address cases of disorderly or unruly behavior of groups.

A small number of violations refer to nonpayment of fees, parking violations, misuse of trails, and recreation site occupancy violations. Some illegal activities go unnoticed and it is difficult to enforce all laws and regulations. Approximately 25% of a LEOs time is related to enforcement associated with motor vehicle use and travel management.

The State of Oregon OHV allocation committee provides grant funding opportunities quarterly; law enforcement grant opportunities are offered once a year. The OHV grant process requires that the applicant provide 20-50 percent of the project cost as matching funds. The matching fund component can be met with in-kind services or materials. Appropriated annual funding would be used to meet the 20-50 percent matching funding or in-kind services/materials for requests placed to the State of Oregon OHV Grant opportunities. The RRSNF receives an annual budget to fund \$160,000 of the cost of law enforcement personnel and contract deputies through the Jackson and Curry County Sheriff's departments. Currently, there is no funding for Josephine and Coos Counties.

b. Direct and Indirect Effects of Alternatives

Under **Alternative 1, No Action**, LEOs and FPOs would continue to enforce laws and regulations to the best of their abilities. However, illegal activities would continue to occur due to a limited number of personnel who must cover a broad geographic range from the coast to the Cascades.

Under **Alternatives 2, 3, and 4, (the Action Alternatives)** the RRSNF would utilize grant funding as well as agency appropriated funds to increase staff patrols. Utilizing uniformed staff and volunteers, the Forest would seek to increase compliance with the new rules and regulations, increase agency visibility, and increase visitor safety on public lands. The premise is that an educated vehicle operator is a responsible operator. LEOs and FPOs would communicate with visitors, hand out maps, and remind visitors of responsible driving practices. Ethics and principles in programs such as "*Leave No Trace, Right Rider*" and "*TREAD Lightly!*" would be promoted through this program. Grant funding would provide for better law enforcement through an increased presence, but motorized use violations would continue to occur, especially when LEOs are assigned to cases that involve more serious types of criminal activity.

Implementation of the Travel Management Rule and publication of the MVUM would initially confuse some Forest visitors. Currently, most areas on the Forest are "open unless posted closed." Under the Rule areas are closed unless posted open. It will be the responsibility of the user to obtain and use the MVUM. In the short term, enforcement issues are expected to increase due to the new regulations. In the long term, it is expected that Forest visitors will become accustomed to the MVUM, which will clearly show where motorized use is allowed.

It is impossible to predict the public's compliance rate with new travel regulations, though certain issues like the complexity of regulations and the clarity of permissible uses certainly has an effect on people's willingness and ability to comply. Alternative 2 more closely follows current regulations on motorized use so it would be more enforceable in the short term than Alternatives 3 and 4 where more change is proposed. Alternative 4 has the greatest amount of change from the current condition and would be the most difficult to enforce in the short term, particularly on motorized trails that are proposed for closure in this alternative.

The Action Alternatives involve changes in culture from historic access and freedoms on the Forest that some users enjoyed. A well-designed implementation and monitoring plan for realizing those changes is an important component for successful implementation of the new direction.

c. Cumulative Effects

The enforcement issue and narrative describes a managerial situation as opposed to environmental effects; therefore, cumulative effects discussions are not relevant to this analysis.

16. Cultural Resources

Will motorized vehicle use affect heritage or cultural resources or Native American values?

Designation of routes and areas for motor vehicle use on the Rogue River–Siskiyou National Forest has potential to affect cultural resource sites, including archaeological and historical sites, and areas of American Indian tribal concern.

a. Background

All formal decisions made by the Forest Service during the travel system designation process are considered “undertakings” pursuant to Section 106 of the National Historic Preservation Act (NHPA) and its implementing regulations. Forests are responsible for initiating and completing the appropriate NHPA compliance for each decision affecting their transportation system. This responsibility consists of evaluating the potential effect of these decisions on historic properties in conformance with 36 CFR Part 800 and applicable programmatic agreements (PA).

Cultural resource concerns have been taken into account early in the motorized use designation process, with specific resource concerns contributing to the development of the Proposed Action. The Area of Potential Effect (APE) for proposed ground disturbance have been identified, issues and at-risk resources identified, potential effects evaluated, protection measures established, and plans developed for monitoring the effectiveness of protection measures.

Tribal consultation was conducted with the seven Federally-recognized Indian tribes whose traditional territory included all or a portion of the RRSNF. Government-to-Government consultation letters were mailed on August 18, 2008 to Confederated Tribes of Siletz Indians, Confederated Tribes of the Grand Ronde Community, the Klamath Tribes, Cow Creek Band of Umpqua Tribe of Indians, Smith River Rancheria, Coquille Tribal Council, and to the Quartz Valley Indian Tribe. The scoping process for this project officially began with the issuance of a Notice of Intent to prepare an Environmental Impact Statement published in the Federal Register on August 26, 2008 (FR page 50299-50301). Tribal concerns were incorporated into either the Proposed Action, an alternative to the Proposed Action, or would be addressed through mitigation.

Overviews of the cultural background of the RRSNF can be found in two documents: Cultural resource Overview of the Siskiyou National Forest (Beckham 1978), and Prehistory and History of the Rogue River National Forest: A Cultural Resource Overview (LaLande 1980).

b. Effects Mechanisms and Analysis Framework

Cultural resources can be affected by:

- 1) Ground disturbance caused by construction of new OHV trails and “play” areas.
- 2) Ground disturbance on areas without previous use.
- 3) Concentrating use from currently open roads onto formally designated roads.
- 4) Potential increased use of designated roads puts specific vulnerable sites at greater risk of vandalism and looting.

Beneficial effects can also be derived from certain transportation system decisions. Re-routing ground-disturbing vehicles away from significant sites can help protect them. Re-focusing recreationists’ attention away from areas with archaeological sites can minimize illegal artifact collection. Re-directing public to areas with cultural resource interpretive sites is another potential benefit of motorized use planning.

Research of existing information, tribal consultation, and field survey based on proposed changes and cultural resource site probability are used to determine effects.

Site attributes considered for determining effects and planning mitigation measures include:

- Is the road a braided set of ruts, or are there two well defined tracks limited in their lateral migration by mature standing vegetation or topography?
- Is the surface of the road stable, does it erode easily, or is it on bedrock or natural gravel pavement?
- Is the site visible from the route? Is it attractive to road users?
- Is there potential for subsurface deposits?
- Is there evidence at the site of vehicles parking and people moving around on the site?
- Was the road or trail constructed through the site? Is there evidence of cut and fill slopes, blading, or berms having disturbed cultural deposits?
- Is there evidence of previous motorized vehicle/human effects to ground surface or site features (e.g., vandalism, artifact theft, vehicle donuts)?
- Does the route inappropriately intrude on a culturally important location, such as a traditional plant gathering site or a sacred site?

c. Direct and Indirect Effects of Alternatives

Currently, under the **No Action Alternative**, 275,000 acres of the forest are open to cross-country travel. Impacts to sites from disturbance by OHVs, and vehicle access to sites by looters are both uncontrolled. Effects of many years of OHV use have caused significant damage to some sites. Many of these impacts are neither short-term nor long-term -- they are immediate and permanent. The loss of context, by which archaeologists reconstruct past activities, is an irretrievable loss.

Under **Alternative 2**, Boundary Trail amendments would allow motorized use to continue. Like Alternatives 1, there would be no change in impacts to potential cultural resource sites. Cross-country travel would continue to be authorized on 275,000 acres.

Although not much use is currently seen on most of these acres, authorizing use of this area would allow continued impacts to cultural resource sites from ground disturbance and access by looters. Potential impacts would be the same as in Alternative 1.

No new road or trail closures would occur. As in Alternative 1, this would not change impacts to sites vulnerable to looting. No new play areas would be constructed, so no new ground disturbance would affect cultural resource sites.

There would be no mixed use on paved roads except for existing use on Prospect OHV system. This alternative would have no impact on cultural resource sites.

Dispersed camping would continue as currently existing. Authorizing the 275,000 acres currently open to cross-country travel would maintain current levels and types of dispersed camping use. This alternative would continue to expose a large number of cultural resource sites to the cumulative effects of ground disturbance and access by looters. Like Alternative 1, it would lead to more effects on cultural resource sites than Alternatives 3 and 4.

Under **Alternative 3 (Proposed Action)**, a decrease from 275,000 acres currently open for cross-country travel down to two OHV “play” areas would result in far fewer potential impacts to cultural resource sites from ground disturbance caused by OHVs. A beneficial effect would be achieved by limiting cross-country travel. Any impacts within the new play areas, where activity would be concentrated, would be mitigated.

The small decrease overall in open roads that allow mixed-use would have little impact on cultural resource sites. The slight decrease in access to potential sites by OHV users could put sites at a slightly lower risk of vandalism and theft compared to Alternatives 1 and 2.

A small decrease in the number of miles of trails that allow motorized use would result in slightly less potential for impacts to cultural resource sites from ground disturbance caused by vehicle rutting. This alternative would have a more beneficial effect on cultural resource sites than Alternatives 1 and 2, which would have no change from the current situation.

Two miles of new trail construction would result in a short section of ground disturbance. Cultural resource survey and any necessary mitigation would be implemented prior to construction. This alternative would have more potential to impact cultural resource sites than Alternatives 1, 2 and 4.

Dispersed camping opportunities would be reduced under this alternative. Limited access to, and the resulting decrease in damage to cultural resource sites would derive a beneficial effect. Like Alternative 4, on-going damage would more likely be reduced under this alternative than under Alternatives 1 and 2.

Sixty-two miles of road would be removed from the current 4,613 miles currently open to use. The change in impacts to sites vulnerable to looting from “concentrating” use from so small a percentage of roads onto designated roads would be negligible.

The following discussion presents effects by specific Ranger Districts, with a focus on the action elements as associated with the Proposed Action.

Powers Ranger District

Roads and motorized trails in proposed Copper-Salmon Wilderness would be closed. Mixed use would be designated on approximately 6.2 miles. Neither of these changes would have any affect on cultural resource sites.

Gold Beach Ranger District

Approximately 0.5 miles of new trail would be constructed that would allow motorized use. Trail construction would have potential to impact sites. Survey, evaluation and any mitigation required would occur prior to construction.

The prohibition of mixed use on approximately 12.4 miles of road where it is currently authorized would have a small beneficial effect on cultural resource sites by limiting access to sites.

Wild Rivers Ranger District

Approximately 17.5 miles of road would be closed to public use (roads would still be open for permitted or limited administrative use). This change could have a beneficial effect on cultural resource sites by limiting site access.

Mixed use would be prohibited on approximately 12.1 miles of road where it is currently authorized. This change could have a beneficial effect on cultural resource sites by limiting site access.

Boundary Trail amendments would allow motorized use to continue. No change in impacts to potential cultural resource sites would occur.

Approximately 26 miles of trail that currently allow motorized use would be closed to motorized use. This change could have a beneficial effect on cultural resource sites by limiting site access.

Medford BLM is considering construction of a large OHV play area on neighboring lands, which *may* decrease OHV use on the Wild Rivers RD, providing a potential beneficial effect on cultural resources.

Siskiyou Mountains Ranger District

Motorized use would be prohibited on approximately 4 miles of trail that currently allows motorized use. This would have no adverse effect on cultural resources, and in some cases, a beneficial effect is possible.

Approximately 1.2 miles of trail would be constructed that would allow motorized use. Survey, evaluation and any required mitigation would occur prior to construction. The Proposed Action provides an opportunity for historic interpretation of Penn Sled Trail.

Boundary Trail amendments would allow motorized use to continue. No change in impacts to potential cultural resource sites would occur.

High Cascades Ranger District

Approximately 31.5 miles of paved road would be designated for mixed use. A slight increase in use of the road could result in a small increase to impacts to cultural resource sites from increased access to sites.

An additional OHV play area would be developed. Construction activities would result in ground disturbance which could impact cultural resource sites. Survey, evaluation and any mitigation required would occur prior to construction. Overall, concentrating motorized use away from cultural resource sites would have a beneficial effect.

Alternative 4 would have no new trail or play area construction. As under Alternatives 1 and 2, cultural resource sites would not be impacted by new construction. Alternative 3 does have potential to impact cultural resource sites through ground disturbance due to new trail or play area construction.

The Boundary Trail and all connectors would prohibit motorized use. This change would have a beneficial effect on cultural resources by reversing currently authorized motorized use. This alternative would have fewer effects than Alternatives 1, 2 and 3 on cultural resources.

No motorized use would be allowed in IRAs, most Botanical Areas, or any serpentine areas except on existing roads. Compared to Alternatives 1, 2, and 3, this alternative would result in fewer impacts to cultural resource sites in certain areas by restricting access to archaeological sites vulnerable to theft, and by decreasing potentially ground disturbing vehicular use.

No mixed use would be allowed on paved roads except for existing use on the Prospect OHV system. Like Alternatives 1 and 2, no impacts to cultural resources would result. Slightly more impacts caused by increased access to sites are likely as a result of Alternative 4, which does allow a small amount of mixed use.

Dispersed camping opportunities would be reduced under this alternative. Limited access to, and the resulting decrease in damage to cultural resource sites would derive a beneficial effect. On-going damage would more likely be reduced under this alternative than under Alternatives 1 and 2.

This project is determined to be a “**no historic properties**” undertaking. This determination was made by the Forest Archaeologist under the terms of the 2003 Programmatic Agreement between ACHP, Oregon SHPO, and USFS R6.

d. Cumulative Effects

Present and foreseeable future actions that may affect cultural resources on the Forest include: wildland fire, fuels treatments, livestock grazing, dam maintenance, minerals management, developed and dispersed recreation, timber harvest and vegetation treatments, reforestation, restoration, road management, and special uses. All of these activities would be designed to meet the direction provided within the Northwest Forest Plan and the local Land and Resource Management Plans (i.e., Forest Plans), and in accord with Aquatic Conservation Strategy objectives (NWFP 1994, Rogue River NF LRMP 1990, and Siskiyou NF LRMP 1989).

None of the alternatives would result in substantial direct or indirect adverse effects to cultural resources. Thus, implementation of the project is not expected to result in detrimental cumulative effects to terrestrial wildlife species or habitat.

All routes that are being considered for designation within the alternatives of this project currently exist and are receiving some amount of use. Further, it is assumed that because of this existing use, regardless of which alternative is selected, detrimental effects to cultural resources from the motorized route network would either be reduced or maintained when compared to the current condition.

17. Climate Change

Will motorized vehicle use designation affect climate change (greenhouse gas emissions and carbon cycling) and will global climate change affect this designation?

Forest Service Chief Abigail R. Kimbell has characterized the Agency's response to the challenges presented by climate change as "one of the most urgent tasks facing the Forest Service" and stresses that "as a science-based organization, we need to be aware of this information and to consider it any time we make a decision regarding resource management, technical assistance, business operations, or any other aspect of our mission."¹⁰

a. Background

Ongoing climate change research has been summarized in reports by the United Nations Intergovernmental Panel on Climate Change (www.ipcc.ch), US Climate Change Science Program's Science Synthesis and Assessment Products and the US Global Change Research Program. Climate change studies specific to the Pacific Northwest have been conducted by the Climate Impacts Group at the University of Washington. These reports concluded that climate is already changing; that the change will accelerate in the future; and that human greenhouse gas emissions, primarily carbon dioxide emissions (CO₂), are the main source of accelerated climate change.

Projected global 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. These changes will vary regionally and affect renewable resources, aquatic and terrestrial ecosystems, and agriculture. While uncertainties will remain regarding the timing and magnitude of climate change impacts, the scientific evidence predicts that continued increases in greenhouse gas emissions will lead to increased climate change.

b. Analysis Framework

As noted in the issue statement, there are two types of climate change effects for proposed projects to consider, as appropriate:

¹⁰ Abigail R. Kimbell, Chief, USDA Forest Service, February 15, 2008, letter to Forest Service National Leadership Team

- **The effect of a proposed project on climate change** (greenhouse gas emissions and carbon cycling). Examples include: short-term greenhouse gas emissions and alteration to the carbon cycle caused by hazardous fuels reduction projects, greenhouse gas emissions from oil and gas field development, and avoiding large greenhouse gas emissions pulses and effects to the carbon cycle by thinning overstocked stands to increase forest resilience and decrease the potential for large scale wildfire.
- **The effect of climate change on a proposed project.** Examples include: effects of expected shifts in rainfall and temperature patterns on the seed stock selection for reforestation after timber harvest and effects of decreased snow fall on a ski area expansion proposal at a marginal geographic location, such as a southern aspect or low elevation.

Determining whether there is a cause-effect relationship is the first step in identifying a potential issue. Consideration was given as to whether some element of the proposal would result in direct, indirect, or cumulative effects on greenhouse gas emissions or the carbon cycle and the direction of effects (e.g., increase, decrease, or combination of both)

Scoping was used to determine if climate change issues are specifically related to the Proposed Action. While climate change was not dismissed as “outside the scope” of the analysis, the Interdisciplinary Team and other sources identified only minor potential for a cause-effect relationships (having to do with fossil fuel combustion and emissions) between this proposal and climate change.

c. Direct and Indirect Effects of Alternatives

Many proposed projects and programs would emit greenhouse gases (direct effect) and, thus, contribute to the global concentration of greenhouse gases that could affect climate (indirect effect). Since greenhouse gases mix readily into the global pool of greenhouse gases, it is not currently possible to ascertain the effects of emissions from single or multiple sources (project).

Also, because Forest Service projects are extremely small in the global atmospheric CO₂ context, it is not presently possible to conduct quantitative analysis of actual climate change effects based on individual or multiple projects.

All alternatives considered with this proposal were identified to have minor cause-effect relationships to greenhouse gas emissions or the carbon cycle, and were determined to be of such a minor scale at the global or even regional scale, that the direct effects would be meaningless to a reasoned choice among alternatives.

Forests play a major role in the carbon cycle. The carbon stored in live biomass, dead plant material, and soil represents the balance between CO₂ absorbed from the atmosphere and its release through respiration, decomposition, and burning. Over longer time periods, indeed as long as forests exist, they will continue to absorb carbon.

The direct and indirect effects regarding these relationships are insignificant because there would be very minimal amounts of vegetation (no trees of any substantial diameters) and disposal of brush and slash associated with trail clearing or maintenance would be very minor under all alternatives.

d. Cumulative Effects

As greenhouse gas emissions are integrated across the global atmosphere, it is not possible to determine the incremental cumulative impact on global climate from emissions associated with any number of particular projects. Nor is it expected that such disclosure would provide a practical or meaningful effects analysis for local project decisions. Uncertainty in climate change effects is expected since it is not possible to meaningfully link individual project actions to quantitative effects on climatic patterns.

It is recognized that global climate change may affect human health, that there is scientific controversy surrounding the effects of human activity on climate change, that there is uncertainty and unknown risks associated with global climate change. The ultimate effects on climate change are indeed the results of incremental cumulative effects of many actions, most of which are outside of the Agency's control.

G. OTHER EFFECTS

The following is a summary of effects that were considered during the analysis process, not necessarily as issues, and not always totally quantifiable. All effects analyzed for all Action Alternatives were determined to be consistent with goals, objectives and Standards and Guidelines identified in the Rogue River and Siskiyou National Forest Land and Resource Management Plans as amended by the Northwest Forest Plan.

1. Relationships Between Local and Short-term Uses of the Human Environment and Maintenance or Enhancement of Long-term Productivity

Analysis indicates that long-term production and maintenance of water quality and soils, would be enhanced by the implementation of Action Alternatives. Under the No Action Alternative, certain risks to water and soils would continue.

2. Environmental Justice

Environmental Justice means that, to the greatest extent practicable and permitted by law, all populations are provided the opportunity to comment before decisions are rendered on, are allowed to share in the benefits of, are not excluded from, and are not affected in a disproportionately high and adverse manner, by government programs and activities affecting human health or the environment.

One goal of Executive Order 12898 is to provide, to the greatest extent practicable, the opportunity for minority and low-income populations to participate in planning, analysis, and decision-making that affects their health or environment, including identification of program needs and designs.

This public involvement process for the Proposed Action has been conducted under Departmental regulation 5600-2, December 15, 1997, including the Environmental Justice Flowchart (Appendix E of the regulation). The Proposed Action, its Purpose and Need, and area of potential effect have been clearly defined. Scoping under the National Environmental Policy Act has utilized extensive and creative ways to communicate.

The Action Alternatives do not appear to have a disproportionately high or adverse effect on minority or low-income populations. Extensive scoping did not reveal any issues or concerns associated with the principles of Environmental Justice. No mitigation measures to offset or ameliorate adverse affects to these populations have been identified. All interested and affected parties will continue to be involved with the public involvement and decision process.

3. Adverse Environmental Effects Which Cannot Be Avoided

The implementation of either Action Alternatives would result in some minor adverse impacts to the physical, biological, and human environments. Many of these impacts can be mitigated to acceptable levels using the Mitigation Measures specified by resource topic and alternative (see EIS Chapter II). The unavoidable adverse impacts summarized below are those that are expected to occur after the application of mitigation measures, or cannot be mitigated to a level approaching existing conditions.

Sediment delivery and water quality: Although mitigation measures (Best Management Practices) are expected to reduce the potential for accelerating sediment production to near baseline levels, there is a minimal risk for short-term indirect impacts to water quality as a result of implementing any of the Action Alternatives.

Soils/site productivity: Under the Action Alternatives, some detrimental soil impacts could occur as a result of the use of equipment to create or maintain roads and trails. Mitigation measures would limit the detrimental areas to meet R6 and Forest Standards and Guidelines for soil protection.

Wildlife: As a result of the motorized vehicle use designation, some wildlife species may be adversely impacted by disturbance. Mitigation measures and project design criteria are expected to minimize these impacts. Impacts specific to the species considered is discussed in detail in this Chapter.

4. Effects on Wetlands and Floodplains

Wetlands associated with Executive Order 11990, are likely to exist on Forest but do not exist within areas proposed for motorized vehicle use designations. If any wetlands were to be located during development, appropriate buffers would be provided in compliance with the Aquatic Conservation Strategy of the Northwest Forest Plan.

There would be no effects on floodplains associated with Executive Order 11988 as a result of implementing this proposal, as none would be affected.

5. Irreversible and Irretrievable Effects

Irreversible commitment of resources refers to a loss of non-renewable resources, such as mineral extraction, heritage (cultural) resources, or to those factors, which are renewable only over long time spans, such as soil productivity. Publication of the MVUM does not create effects that are irretrievable and there are no substantial irreversible effects from the change being proposed under the Action Alternatives.

6. Effects on Prime Farmland, Rangeland and Forest Land

All alternatives are in keeping with the intent of Secretary of Agriculture Memorandum 1827 for prime farmland. The Forest does not contain any prime farmlands or rangelands. Prime forest land is not applicable to lands within the National Forest System. Under all alternatives, Forest system lands would be managed with coordination and sensitivity to the effects on adjacent lands.

7. Energy Requirements of Alternatives

Under all alternatives, various amounts of fossil fuels, and human labor would be expended. Fossil fuel energy would not be retrievable. However, they are not in short supply and their use would not have an adverse effect upon continued availability of these resources.

8. Effects of Alternatives on Minorities and Women

Tribal consultation was conducted with the seven federally-recognized Indian tribes whose traditional territory included all or a portion of the RRSNF. Government-to-Government consultation letters were mailed on August 18, 2008 to Confederated Tribes of Siletz Indians, Confederated Tribes of the Grand Ronde Community, the Klamath Tribes, Cow Creek Band of Umpqua Tribe of Indians, Smith River Rancheria, Coquille Tribal Council, and to the Quartz Valley Indian Tribe.

Tribal concerns were incorporated into either the Proposed Action, an alternative to the Proposed Action, or will be addressed through mitigation. There would be no discernable differences among alternatives regarding effects on Native Americans, women, other minorities, or the Civil Rights of any American Citizen.

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