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Department of
Agriculture

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Service

Pacific Southwest Region

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Final Environmental Impact Statement

Motorized Travel Management (formerly Motorized Route Designation)

Klamath National Forest
California and Oregon

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Motorized Travel Management

Final Environmental Impact Statement

Siskiyou County, California and Jackson County, Oregon

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Abstract: This Final Environmental Impact Statement (FEIS) describes seven alternatives, six of which propose changes to the National Forest Transportation System (NFTS) and would prohibit cross-country travel on the Klamath National Forest (KNF). These actions are needed in order to implement the 2005 Travel Management Rule (36 CFR Part 212, Subpart B) while providing for a diversity of motor vehicle recreation opportunities and providing motorized access to dispersed recreation opportunities on the KNF. The FEIS discloses environmental impacts associated with the proposed action, a no action alternative, and 5 additional action alternatives developed to meet the purpose and need and to respond to issues raised by the public.

Alternative 1 is the no action alternative. Under this alternative, no changes would be made to the current NFTS and there would be no cross-country travel prohibition. Current management plans would continue to guide project area management. The Travel Management Rule would not be implemented, and no motor vehicle use map (MVUM) would be produced. Motor vehicle travel by the public would not be limited to designated routes.
Alternative 2 is the proposed action. It includes the prohibition of cross-country motorized travel, proposed changes to the existing NFTS including vehicle class, and the additions to the NFTS as described in the Notice of Intent (NOI) published October 7, 2008 (Volume 73, Number 195). It also includes a non-significant amendment to the Klamath Forest Plan to be consistent with the Travel Management Rule.
Alternative 3 meets the objective of prohibiting cross-country travel, but proposes no additions to the existing NFTS system of roads and trails. Alternative 3 also addresses three significant issues regarding maintenance costs, wilderness/quiet use, and natural resource impacts.
Alternative 4 responds to three significant issues regarding maintenance costs, wilderness/quiet use, and natural resource impacts by prohibiting cross-country travel and adding fewer routes to the NFTS than alternative 2.
Alternative 5 responds to a significant issue regarding access and motorized recreation opportunity. This alternative is based on corrections to the proposed action (see alternative 6) and proposed changes to the existing NFTS including vehicle class, additional routes, and mixed use to provide for more access and motorized recreation opportunity.
Alternative 6 is the refined proposed action. It is based on the original proposed action (alternative 2) which was developed to meet the purpose and need described in the October 7, 2008 Notice of Intent. It incorporates corrections of errors/omissions identified through further field reconnaissance and administrative review, and proposes changes to the existing NFTS including vehicle class, additional routes, and mixed use to provide for more access and motorized recreation opportunity.

Alternative 7 responds to public comments received on the Draft EIS, and includes some routes which were inadvertently left out of any action alternative. This alternative is based on corrections to the proposed action (see alternative 6) and proposed changes to the existing NFTS including vehicle class, additional routes, and mixed use to provide for more access and motorized recreation opportunity.

Reviewers should provide the Forest Service with their comments during the review period of the final environmental impact statement. This will enable the Forest Service to consider and address reviewers comments and any new information acquired from these comments in the preparation of the Record of Decision, thus avoiding undue delay in the decisionmaking process. Reviewers have an obligation to structure their participation in the National Environmental Policy Act process so that it is meaningful and alerts the agency to the reviewers' position and contentions. Vermont Yankee Nuclear Power Corp. v. NRDC, 435 U.S. 519, 553 (1978). Environmental objections that could have been raised at the draft stage may be waived if not raised until after completion of the final environmental impact statement. City of Angoon v. Hodel (9th Circuit, l986) and Wisconsin Heritages, Inc. v. Harris, 490 F. Supp. 1334, 1338 (E.D. Wis. 1980). Comments on the final environmental impact statement should be specific and should address the adequacy of the statement and the merits of the alternatives discussed (40 CFR 1503.3).

The opportunity to comment will end 30 days following publication of the notice of availability (NOA) in the Federal Register.

Send comments to:

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Acceptable format(s) for electronic comments are MS Word (.doc) and Rich Text Format (.rtf)

Summary of the Final Environmental Impact Statement (FEIS)

Preferred Alternative

The Preferred Alternative for the Klamath National Forest (KNF) Travel Management project proposes the following actions:

1) Prohibit cross-country motor vehicle travel off designated National Forest Transportation System (NFTS) roads, motorized trails, and areas by the public except as allowed by permit or other authorization (excluding snowmobile use).
2) Make two non-significant amendments to the Klamath National Forest Land and Resource Management Plan (LRMP):

   Change the LRMP to conform with the Travel Management Rule, Subpart B, by removing reference to OHV cross-country travel in the Forest Plan and including a Forestwide standard: "Prohibit motorized vehicle travel (with the exception of snowmobiles) off designated roads, trails and areas except as allowed by permit or other authorization."

   Change LRMP Forestwide standard 8-37 to read "Restrict activities within ¼ mile of active Swainson's hawk nests during the nesting season (April 15 to August 15). Lands within the Butte Valley National Grassland are exempt from this restriction."
3) Add 32 existing unauthorized routes (approximately 28 miles) to the NFTS as roads open to the public for motorized vehicle use by vehicle class and season of use. Add 192 existing unauthorized routes (approximately 25 miles) to the NFTS as roads open to the public for motorized vehicle use to access dispersed recreation opportunities (e.g. river access, dispersed camping, etc.) by vehicle class and season of use.
4) Add 28 existing unauthorized routes (approximately 20.6 miles) to the NFTS as motorized trails open to the public for motorized vehicle use by vehicle class and season of use.
5) Allow motorized vehicle use on two open riding areas (53 acres) where motorized vehicles would be allowed anywhere within those delineated areas.
6) Make the following changes to existing NFTS roads:
   - Allow non-highway legal vehicle use on 14 NFTS roads (approximately 131 miles) where such use is currently prohibited.
   - Prohibit non-highway legal vehicle use on 7 NFTS roads (approximately 8 miles) where such use is currently allowed.

- Open NFTS road 41S10 to public use where such use is currently prohibited to enhance motorized recreation by creating a loop opportunity.
- Convert 18 NFTS Maintenance Level (ML) 3 roads (approximately 130 miles) to ML 2 to allow both highway legal and non-highway legal vehicle use and reduce maintenance costs.

Proposed changes to existing NFTS roads are discussed in detail in the Transportation section of Chapter 3.

Significant Issues

Internal and external scoping identified the following significant issues which were used in developing the action alternatives. The significant issues include the following:

Table S - 1. List of significant issues

Issue Topic	Cause and Effect
1. Access and Recreation Opportunity	The proposed action unreasonably restricts motorized recreation use by prohibiting cross-country travel. The addition of 92 miles of unauthorized routes to the NFTS does not provide enough motorized public access or diversity of motorized recreational opportunity to Klamath National Forest lands, including loops, connecting scenic destinations, campgrounds, local services, watersheds, and low and high elevation areas.
2. Maintenance Cost	The NFTS is too large to provide adequate maintenance and administration, given the current maintenance backlog. No new roads should be created as existing roads are largely unmaintained.
3. Wilderness / Inventoried Roadless Areas (IRAs)	Some roads proposed for addition to the NFTS are in close proximity to wilderness or inventoried roadless areas. The designation of unauthorized routes near these areas would encourage incursion of motorized use into the wilderness, and impact the ability of people to enjoy a quiet recreation experience.
4. Resource Impacts	Many of the unauthorized routes proposed for addition to the NFTS are poorly located and will cause adverse impacts to plants, wildlife, water quality, soils, riparian areas, and other natural resources.

Alternatives Considered in Detail

The KNF developed seven alternatives: the no action, the proposed action, and 5 other action alternatives to meet the purpose and need, respond to the significant issues listed above, and respond to public comment. The seven alternatives considered in detail for this analysis are listed in Table S - 2 below. Complete details of the alternatives are found in chapter 2 of this document.

Table S - 2. List of alternatives considered in detail

Alternative 1: No Action Alternative	The no action alternative provides a baseline for comparing the other alternatives. Under the no action alternative, no changes would be made to the current NFTS and there would be no cross-country travel prohibition. Current management plans would continue to guide project area management. The Travel Management Rule would not be implemented, and no motor vehicle use map (MVUM) would be produced. Motor vehicle travel by the public would not be limited to designated routes. Unauthorized routes would continue to proliferate and have no status or authorization as NFTS facilities. **Adds no new NFTS Facilities** **Does not prohibit cross-country motorized travel.**
Alternative 2: Proposed	The proposed action was developed by an interdisciplinary team using input on public-identified inventoried unauthorized routes, maintenance level 1 roads, and mixed use on maintenance level 3 roads. It includes proposals to prohibit cross-country motorized travel, change the existing NFTS, and add to the NFTS as described in the Notice of Intent (NOI) published October 7, 2008 (Volume 73, Number 195).

Action	The proposed action is the proposed changes to the NFTS and the prohibition of cross country travel as described in the NOI published in the Federal Register on 10/7/08: **Adds 22 unauthorized routes (14 miles) to the NFTS as motorized trails** **Adds 258 unauthorized routes (24 miles) to the NFTS as roads to access dispersed recreation sites** **Adds 84 unauthorized routes (54 miles) to the NFTS as roads** **Opens 65 acres (2 areas) to motorized cross-country travel as open riding areas** **Allows mixed use on portions or all of 24 NFTS roads (88 miles*)** **Prohibits mixed use on portions or all of 8 NFTS roads (10 miles)** **Opens 2 ML1 NFTS roads (9.96 miles)** **Prohibits cross-country motorized travel and amends the LRMP with the prohibition** *After the NOI was published, this number was validated and should actually be 119 miles.
Alternative 3: Cross-Country Travel Prohibition Only - No Changes to the Current NFTS	Alternative 3 would prohibit cross-country travel and proposes no new additions to the existing system of roads and trails. This alternative also provides a baseline for comparing the impacts of other alternatives that propose changes to the NFTS. Alternative 3 responds to issues 2-4 (cost, maintenance, wilderness, quiet use, and natural resource impacts). • **Adds no new NFTS facilities** • **Prohibits cross-country motorized travel and amends the LRMP with the prohibition**
Alternative 4: Maximize Quiet Recreation Opportunities	Alternative 4 responds to issues 2-4 (cost, maintenance, wilderness, quiet use, and natural resource impacts) by prohibiting cross-country travel and adding fewer routes to the NFTS. • **Adds 2 unauthorized routes (0.73 miles) to the NFTS as motorized trails** • **Adds 25 unauthorized routes (1.71 miles) to the NFTS as roads to access dispersed recreation sites** • **Adds 12 unauthorized routes (4.45 miles) to the NFTS as roads** • **Allows mixed use on portions or all of 25 NFTS roads (119.25 miles)** • **Prohibits mixed use on portions or all of 7 roads (7.66 miles)** • **Prohibits cross-country motorized travel and amends the LRMP with the prohibition**
Alternative 5: Maximize Motorized Recreation Opportunities	Alternative 5 responds to issue 1 (access and motorized recreation opportunity). This alternative is based on the refined proposed action (Alternative 6) with additional routes and mixed use to provide for more access and motorized recreation opportunity. • **Adds 33 unauthorized routes (21.77 miles) to the NFTS as motorized trails** • **Adds 206 unauthorized routes (30.56 miles) to the NFTS as roads to access dispersed recreation sites** • **Adds 29 unauthorized routes (16.69 miles) to the NFTS as roads** • **Opens 53 acres (2 areas) to motorized cross-country travel as open riding areas** • **Allows mixed use on portions or all of 33 NFTS roads (277.77 miles)** • **Prohibits mixed use on portions or all of 7 NFTS roads (7.66 miles)** • **Opens 1 closed level 1 NFTS road (4.66 miles)** • **Prohibits cross-country motorized travel and amends the LRMP with the prohibition**
Alternative 6: Refined Proposed Action	The original proposed action was developed to meet the purpose and need described in the October 7, 2008 Notice of Intent. Additional field reconnaissance and analysis of the existing data led to refinement of the proposed action. These refinements are discussed in detail in chapter 2: This alternative: • **Adds 30 unauthorized routes (18.42 miles) to the NFTS as motorized trails** • **Adds 164 unauthorized routes (26.30 miles) to the NFTS as roads to access dispersed recreation sites** • **Adds 26 unauthorized routes (14.58 miles) to the NFTS as roads** • **Opens 53 acres (2 areas) to motorized cross-country travel as open riding areas** • **Allows mixed use on portions or all of 21 NFTS roads (105.21 miles)** • **Prohibits mixed use on portions or all of 7 NFTS roads (7.66 miles)** • **Opens 1 ML1 NFTS road (4.66 miles)** • **Prohibits cross-country motorized travel and amends the LRMP with the prohibition**

Alternative 7: Preferred Alternative	Alternative 7 responds to public comments received after publication of the draft environmental impact statement. This alternative is based on the refined proposed action (alternative 6) with additional routes and changes in maintenance levels for several roads. It also includes refined mileage figures. • **Adds 28 unauthorized routes (20.59 miles) to the NFTS as motorized trails** • **Adds 192 unauthorized routes (25.09 miles) to the NFTS as roads to access dispersed recreation sites** • **Adds 32 unauthorized routes (28.55 miles) to the NFTS as roads** • **Opens 53 acres (2 areas) to motorized cross-country travel as open riding areas** • **Allows mixed use on portions or all of 14 NFTS roads (131.45 miles)** • **Prohibits mixed use on portions or all of 7 NFTS roads (7.66 miles)** • **Opens 1 ML1 NFTS road (4.66 miles)** • **Converts 18 ML3 roads (130.15 miles) to ML2** • **Prohibits cross-country motorized travel and amends the LRMP with the prohibition** • **Amends the LRMP to exempt 3 roads (13 miles) in the Butte Valley National Grassland from implementation of a season of use for Swainson's hawks per LRMP standard 8-37**

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Chapter 1 - Purpose of and Need for Action

Document Structure

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

- **Chapter 1.** Purpose and Need for Action: This chapter briefly describes the proposed action, the need for that action, and other purposes to be achieved by the proposal. This section also details how the Forest Service informed the public of the proposed action and how the public responded.
- **Chapter 2.** Alternatives, including the Proposed Action: This chapter provides a detailed description of the agency's proposed action, as well as alternative actions that were developed in response to comments raised by the public during scoping. The end of the chapter includes a summary table comparing the proposed action and alternatives with respect to their environmental impacts.
- **Chapter 3.** Affected Environment and Environmental Consequences: This chapter describes the environment that will be affected and the environmental impacts of the proposed action and alternatives, as well as discussing the short-term uses and long-term productivity, unavoidable adverse effects, irreversible and irretrievable commitments of resources, energy requirements, and legal and regulatory compliance.
- **Chapter 4.** Preparers, Consultation, Distribution, Glossary, References, and Index: This chapter provides a list of preparers and agencies consulted during the development of the environmental impact statement; lists agencies, organizations and individuals to which this document is being sent; and includes lists of commonly used acronyms, a glossary, references cited, and an index.
- **Appendices:** The appendices provide detailed information to support the analyses presented in the environmental impact statement.

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

Changes Between Draft and Final Document

Changes have occurred between the DEIS and this FEIS. Key changes are discussed in this section.

In response to public comment and refinements in the analyses, an additional alternative (Alternative 7) was developed. The recommendation in the Motorized Mixed Use Analysis (MMUA) regarding changing maintenance levels of roads currently on the NFTS was incorporated into this alternative. Therefore, the number of miles of road proposed for mixed use on maintenance level (ML) 3 roads has declined, and the number of miles proposed for conversion to ML2 has increased in this alternative. The effects of Alternative 7 have been analyzed and are disclosed in Chapter 3.

Mitigations common to all action alternatives have been augmented and modified. New mitigation measures are described in Chapter 2, and include:

- Share-the-Road signs will be installed on ML 3 roads selected for mixed use to inform drivers of highway-legal vehicles that the route is open for use by non-highway-legal vehicles
- Mixed use roads will be closed to non-highway legal vehicles and/or other traffic through use of a Forest Order when commercial traffic (e.g. logging or chip trucks) is scheduled.
- One cultural resource site will be screened using cut vegetation, and a complete item-by-item inventory of the site will be completed for the alternatives (Alternatives 5 and 6) that include adding a route to the NFTS in the vicinity of this site.

Routes through ultramafic rock proposed for mixed use in the DEIS have been tested for the presence of asbestos. Test results indicate that asbestos is not present in quantities beyond the threshold deemed unsafe for motorized use of rural routes. Therefore, the mitigation regarding provision of information to the public regarding safe use of these roads and methods for reducing exposure has been removed.

Information regarding publication and use of the Motor Vehicle Use Map has been included in Chapter 2.

A change was made between DEIS and FEIS to correct the maintenance level of the South Fork of Indian Creek Road to fit the current condition and the data in INFRA. The road (17N32) is blocked with a barrier from its west intersection with road 17N43. Eight miles of NFTS road are not available to public use. These 8 miles of road 17N32 (shown as ML2 on DEIS maps) are in ML 1 status and the DEIS maps were modified to display the correct condition.

A section documenting the effects of the alternatives on Port-Orford-cedar was added to Chapter 3.

A number of inventoried unauthorized routes were field reviewed between DEIS and FEIS to validate earlier GIS-based analysis. Several other routes that were not on the original inventory, but were identified as potential additions to the NFTS in public comments to the DEIS, were also field reviewed; they were analyzed but not included in any action alternative. As a result of these efforts, the original figure of 437 miles of unauthorized routes has been revised to 497 miles.

Resource analyses were updated where necessary; for example, some acreage figures were refined, and the Northern spotted owl habitat analysis was re-run using the 1992 critical habitat layer.

The effects of route addition on fisheries in Key Watersheds (as defined by the KNF Land and Resource Management Plan (LRMP)) are analyzed and displayed.

Background

Over the past few decades, the availability and capability of motor vehicles, particularly off-highway vehicles (OHVs) and sport utility vehicles (SUVs), has increased tremendously. Nationally, the number of OHV recreation users has climbed sevenfold in the past 30 years, from approximately 5 million in 1972 to 36 million in 2000. California is experiencing the highest level of OHV use of any state in the nation. There were 786,914 all-terrain vehicles (ATVs) and OHV motorcycles registered in 2004 in California, up 330 percent since 1980. Annual sales of ATVs and OHV motorcycles in California were the highest in the U.S. for the last 5 years, and four-wheel-drive vehicle sales in California also increased by 1500 percent to 3,046,866 from 1989 to 2002.

Nationwide, unmanaged motor vehicle use, particularly OHV use, has resulted in thousands of miles of unplanned roads and trails, erosion, watershed and habitat degradation, and impacts to cultural resource sites. Compaction and erosion are the primary effects of motor vehicle use on soils. Riparian areas and aquatic dependent species are particularly vulnerable to damage from motor vehicle use. Unmanaged recreation, including impacts from OHVs, is one of “Four Key Threats Facing the Nation’s Forests and Grasslands” (USDA Forest Service, June 2004).

On August 11, 2003, the Pacific Southwest Region of the Forest Service entered into a Memorandum of Intent (MOI) with the California Off-Highway Motor Vehicle Recreation Commission and the Off-Highway Motor Vehicle Recreation Division of the California Department of Parks and Recreation. That MOI set in motion a 5 step region-wide effort to “Inventory and designate OHV roads, trails, and any specifically defined open areas for motor vehicle travel on maps of the 18 National Forests in California by 2007.”

On November 9, 2005, the Forest Service published final travel management regulations in the Federal Register (FR Vol. 70, No. 216-Nov. 9, 2005, pp 68264-68291). Subpart B of the final Travel Management Rule (36 CFR 212) requires designation of those roads, trails, and areas that are open to motor vehicle use on National Forests. Only roads and trails that are part of a National Forest Transportation System (NFTS) may be designated for motorized use. Designations are made by class of vehicle and, if appropriate, by time of year. Part 261 – Prohibitions, Subpart A (36CFR 261.13) of the final rule, prohibits the use of motor vehicles off designated roads, trails and areas, as well as use of motor vehicles on roads and trails that is not consistent with the designations.

On National Forest System (NFS) lands open to cross-country motor vehicle travel, unrestricted repetitive motor vehicle travel has resulted in unplanned and unauthorized routes and areas (roads, trails and areas). These roads, trails and areas were developed without agency authorization, environmental analysis, or public involvement and do not have the same status as NFTS roads and NFTS trails. Nevertheless, some unauthorized routes may be well-sited, provide excellent recreation opportunities for motorized and non-motorized recreation users, and may enhance the NFTS. Other unauthorized routes are poorly-sited and cause unacceptable environmental impacts. Only NFTS roads, NFTS trails, and discrete, specifically delineated open areas can be designated for motor vehicle use. In order for an unauthorized route to be designated for motor vehicle travel, it must first be added to the NFTS. In order for areas to be designated for motor vehicle travel, a discrete, specifically delineated space that is smaller, and in most cases much smaller, than a Ranger District must be identified.

Of the 1.7 million total acres on the Klamath National Forest (KNF), which includes the Butte Valley National Grassland (BVNG), cross-country travel is currently allowed on approximately 1.2 million acres.

In 2005, the KNF began the first 3 steps of the 5 step process to identify routes that may be added to the NFTS. In Step 1, the KNF completed an extensive inventory of unauthorized routes (roads and trails) on NFS lands open to cross-country travel by motor vehicles as described in the regional MOI. In Step 2, the KNF used an interdisciplinary process to review the existing NFTS and the inventory of unauthorized routes to identify proposals for limited changes to the NFTS. In this process, routes were examined to determine if there were either resource concerns or maintenance costs associated with them. This process included review of the KNF land and resource management plan, internal and external discussion, including extensive public collaboration workshops and input, and internal and external validation of the locations of unauthorized routes using the inventory maps. The travel management regulations provide for the incorporation of previous decisions regarding travel management. Routes that are part of the existing KNF transportation system and open to motor vehicle travel will remain designated for such use except as described below under each alternative. This proposal and action alternatives

make needed changes (vehicle class restrictions, additional motorized routes or travel on routes by non-highway vehicles, changes in routes from open to closed and vice versa, etc.) to KNF NFTS roads. They also propose addition of motorized NFTS trails, and add open riding areas on NFS lands in accordance with 2005 Travel Management Rule at 36 CFR Part 212, Subpart B.

In accordance with Subpart B of the Travel Management Rule (36 CFR §212.56), following a decision on this proposal, the KNF will publish a Motor Vehicle Use Map (MVUM) identifying all KNF NFTS roads, trails, and areas that are designated for motor vehicle use. The MVUM shall specify the classes of vehicles and, if appropriate, the time of year for which motor vehicle use is designated. Upon publication of the MVUM, it is prohibited to possess or operate a motor vehicle on NFS lands other than in accordance with those designations. These maps will be made available to the public on the internet and at the headquarters of the Klamath National Forest and Ranger District offices. The unauthorized routes not included in this proposal are not precluded from future consideration for either removal from the landscape and restoration to the natural condition or addition to the NFTS and inclusion on an MVUM. Future decisions associated with changes to the NFTS and MVUM are dependent on results of monitoring use and resource conditions, and available staff and resources. This may trigger the need for additional environmental analysis, public involvement, and documentation. The KNF may initiate such modifications based on recommendations from the public or from agency specialists.

Travel Management on the Klamath National Forest

The Klamath National Forest Transportation System (NFTS) was developed over many decades to meet a variety of needs. These include timber management, fuel treatment, access to private land within the KNF boundary, fire control, utility management, special uses management, harvesting of special forest products such as greenery, firewood, mushrooms and plants, and recreation. Roads were also acquired through past land exchanges or acquisitions. The KNF currently manages and maintains approximately 4,536 miles of NFTS roads. There are no NFTS motorized trails for vehicle use, other than by over-snow vehicles.

The NFTS is managed and maintained to various road standards depending on management objectives. Motorized routes range from paved roads to roughly graded high clearance roads, depending on the type of access necessary. In some cases, where public access is not currently needed, roads are “stored” for future use. The NFTS is displayed on the Forest Transportation Atlas. The Forest Transportation Atlas consists of the maps, inventories and plans for forest transportation facilities and associated information available as of January 12, 2001 (FSM 7711.2). Details concerning the management of individual roads and trails are maintained in the Forest Infrastructure database (INFRA).

In 2002, the KNF populated the INFRA database by examining previous records (maintenance plans, maintenance expenditures, existing road and trail atlases, forest maps, etc.) to

capture the entire NFTS, transfer the necessary information into INFRA and verify the Forest Transportation Atlas. Roads or trails that had no record of being mapped or maintained for a specific use were not included in the NFTS.

Since then, adjustments to the Transportation Atlas and INFRA database have been made to correct errors and account for NFTS roads that were either newly constructed or overlooked in the 2002 effort. The current Forest Transportation Atlas identifies the existing NFTS and the management objectives for each transportation facility. Decisions regarding changes to the NFTS (new road construction, realignment, decommissioning, etc.) are subject to the National Environmental Policy Act (NEPA) and require public involvement and disclosure. The NFTS is always changing depending on resource needs and management concerns.

Management of the transportation system on the Klamath National Forest is a dynamic process. Implementation of this proposal and the subsequent designation of motor vehicle routes through publication of the MVUM is just one project, among many, that affects the Forest's transportation system. Numerous road actions have been accomplished through vegetation management projects, watershed restoration projects, fuel treatment projects, and road management decisions. Ongoing efforts to manage motor vehicle travel on the KNF include reducing adverse environmental impacts associated with unauthorized routes through various project-level planning efforts, and addressing impacts associated with the current NFTS through the Forest's road maintenance program.

Over the last decade, the KNF has moved away from a commodity (timber) focus to one of ecosystem health and integrated vegetation management. In response to this shift, Forest Supervisors initiated a number of actions that reduce both road maintenance needs and deferred maintenance:

1. Road closures have reduced the number of miles of NFTS roads available for motor vehicle use and, in some cases, restricted the season of use. Currently, the Forest has more than 800 miles of road closed year-round and more than 1,000 miles of road closed during wet weather. Over the last decade, approximately 167 miles of road have been permanently decommissioned and removed from the NFTS, and 75 miles of unauthorized routes have been rehabilitated.

2. Over the years, the KNF has systematically addressed design of the low use, native-surfaced roads (ML 2) through a series of storm-proofing projects. Currently 82 percent of these roads are out-sloped, with rolling dips and reduced fills. This improves drainage and reduces the risk of washout or developing gullies. These actions have substantially reduced the need for heavy maintenance and reconstruction.

3. As large truck traffic has declined, around 220 miles of ML 3 roads have been downgraded to ML 2, reducing maintenance needs.

4. A variety of fish passage projects has resulted in culvert replacement and upsizing, reducing the risk of culvert blockage, down-cutting of stream slopes, and loss of fill material.

For a more thorough explanation of the Forest's NFTS and management strategies, refer to Appendix C.

Project Location

This analysis considers the entire Klamath National Forest, including the Ukonom Ranger District which is managed by the Six Rivers National Forest as part of the Orleans Ranger District.

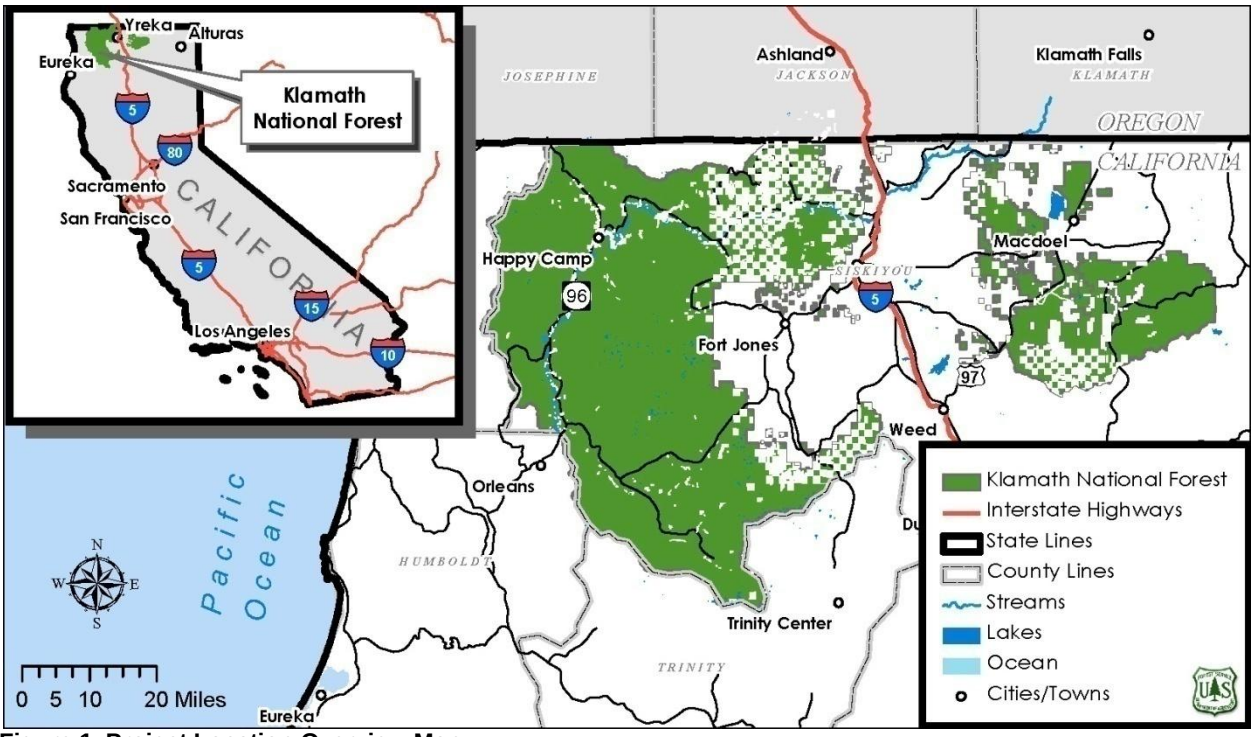

Figure 1. Project Location Overview Map

Purpose and Need

The following needs have been identified for this proposal:

1) There is a need for regulation of unmanaged motor vehicle travel by the public. The proliferation of unplanned, unauthorized, non-sustainable roads, trails, and areas adversely impacts the environment. The 2005 Travel Management Rule, 36 CFR 212, Subpart B, provides for a system of NFTS roads, NFTS trails, and areas on NFS lands that are designated for motor vehicle use. After roads, trails, and areas are designated, motor vehicle use off designated roads and trails and outside designated areas is prohibited by 36 CFR 261.13 Subpart B. This is intended to prevent resource damage caused by unmanaged motor vehicle use by the public.

2) There is a need for the Klamath Forest Plan (LRMP) to conform to the Travel Management Rule, 36 CFR 212 Subpart B. During a review, it was found that the LRMP is not fully consistent with the Travel Management Rule, Subpart B. For example, the LRMP EIS states that off-highway vehicle use is allowed where it is not (1) legislatively restricted, (2) causing unacceptable resource damage, or (3) in conflict with other activities. The objective is to restrict use only where there is a demonstrated need. The LRMP includes standards and guidelines that prohibit or restrict OHV use in certain land allocations (e.g. wilderness, research natural areas, backcountry areas), but OHV use is generally allowed in the other land allocations. About 70 percent of the Forest is open to unrestricted OHV use. These LRMP standards and guidelines are in conflict with the Travel Management Rule, at 36 CFR 212.50 (a) (Motor vehicle use off designated roads and trails and outside designated areas is prohibited by 36 CFR 261.13).

3) There is a need for limited changes to the KNF Transportation System to:

    a) Provide motorized access to dispersed recreation opportunities (camping, hunting, fishing, hiking, horseback riding, etc.). There is a need to maintain motor vehicle access to dispersed recreation activities that historically have been accessed by motor vehicles. A portion of known dispersed recreation activities are not located directly adjacent to an existing NFTS road. Some dispersed recreation activities depend on foot or horseback access, and some depend on motor vehicle access. Those activities accessed by motor vehicles consist of short spurs that have been created and maintained primarily by the passage of motorized vehicles. Many such ‘user-created’ routes are not currently part of the NFTS. Without adding them to the NFTS, the regulatory changes noted above would make continued use of such routes illegal through the prohibition of cross-country travel and would preclude motorized access to many dispersed recreation activities.

b) Provide a diversity of motorized recreation opportunities (4X4 vehicles, motorcycles, ATVs, passenger vehicles, etc.). It is Forest Service policy to provide a diversity of road and trail opportunities for experiencing a variety of environments and modes of travel consistent with the National Forest recreation role and land capability (FSM 2353.03(2)). Implementation of Subpart B of the Travel Management Rule will severely reduce motorized recreation opportunities relative to current levels. As a result, there is a need to consider limited changes and additions to the type of use permitted on existing NFTS roads as well as potential additions to the NFTS.

4) There is a need for socially compatible use by non-highway-legal vehicles in the vicinity of Hawkinsville where trespass, destruction of private property, and other use conflicts facilitated by the use of off-highway vehicles have become a problem. The KNF Land and Resource Management Plan (LRMP) specifies coordination of road management objectives with private landowners within the KNF (LRMP Standard and Guideline 20-3). Previous complaints from residents, and comments during Steps 1-3 for this project, focused on needs for management changes on all or portions of Forest Roads 40N21, 43N30, 45N03X, 45N28, 45N29, 45N39, 46N16, and 46N16A.

In making any limited changes to the National Forest Transportation System, the KNF will be considering criteria contained in Subpart B of the Travel Management Rule, which include the following:

- Impacts to natural and cultural resources.
- Public safety.
- Provision of public recreation opportunities
- Access to public and private lands.
- Conflicts among uses of National Forest System Lands
- Minimizing conflicts among different classes of motor vehicle uses of NFS lands or neighboring federal lands.
- Availability of additional resources for maintenance and administration needs of roads trails and areas if the uses under consideration are designated.
- Minimizing damage to soil, watershed, vegetation, and other forest resources.
- Minimizing harassment of wildlife and significant disruption of wildlife habitat.
- Minimizing conflicts between motor vehicles and existing or proposed recreational uses of NFS lands or neighboring federal lands.

- Minimizing conflicts among different classes of motor vehicle uses of NFS lands or neighboring federal lands.
- Compatibility of motor vehicle use with existing conditions in populated areas, taking into account sound, emissions, and other factors.

When making any limited changes to National Forest System roads, the KNF will also consider the following:

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

Proposed Action

1) Prohibit cross-country motorized vehicle travel (with the exception of snowmobiles) off NFTS roads, trails, and areas by the public except as allowed by permit or other authorization.

2) Make a non-significant amendment to the LRMP to be consistent with the Travel Management Rule (36 CFR Part 212, Subpart B), prohibiting cross-country motorized vehicle travel off designated NFTS roads and NFTS trails outside of designated areas by removing reference to OHV cross-country travel in the Forest Plan and including a forest-wide standard: "Prohibit motorized vehicle travel off designated roads and trails except for administrative use or uses under permitted activities or within designated areas."

3) Add approximately 54 miles (84 existing unauthorized routes) of NFTS roads classified as open to all vehicle classes, both highway legal and non-highway legal, by season of use. The season of use for approximately 8 miles (14 routes) is from May 1 – October 31 (the remainder will be open year round. Add approximately 24 miles (258 existing unauthorized routes) to the NFTS as roads open to the public for motorized vehicle use to access dispersed recreation opportunities (e.g. river access, dispersed camping, etc.), by vehicle class and season of use.

4) Add approximately 14 miles (22 existing unauthorized routes) of NFTS motorized trails. All trails open for motorized use are in the Humbug area. Approximately 2 miles of motorized trails would be classified as open for all trail class vehicles. About 4 miles of motorized trails would be classified as open for motorcycle only. The remaining 8 miles of motorized trails would be classified as open for vehicles 50 inches or less in width. The season of use for all 14 miles of trail is from May 1 – October 31.

5) Add two areas (Humbug [13 acres] and Juniper Flat [52 acres]) where use of motorized vehicles by the public would be allowed anywhere within the designated areas.

6) Make the following changes to existing Forest roads:

   a. Allow non-highway legal vehicle use on approximately 88[b] miles (24 segments) of existing NFTS roads where such use is currently prohibited.

   b. Prohibit non-highway legal vehicle use on approximately 10 miles (8 segments) of existing Forest roads where such use is currently allowed.

   c. Open Forest maintenance level 1 roads 41S10 (Doe Peak) and 40N51 (Yellowjacket Ridge[c]) to public use where such use is currently prohibited.

A detailed description of the proposed action can be found in Chapter 2 of this EIS.

Principal Laws and Regulations Influencing the Scope of this EIS

The National Environmental Policy Act of 1969 (NEPA) requires that all major Federal actions significantly affecting the human environment be analyzed to determine the magnitude and intensity of those impacts and that the results be shared with the public and the public given opportunity to comment. The regulations implementing NEPA further require that to the fullest extent possible, agencies shall prepare environmental impact statements concurrently with and integrated with environmental analyses and related surveys and studies required by the Endangered Species Act of 1973, the National Historic Preservation Act of 1966, and other environmental review laws and executive orders. Principal among these are the Multiple Use and Sustained Yield Act of 1960, the National Forest Management Act of 1976 as expressed through the KNF Land and Resource Management Plan, the Clean Air Act of 1955, the Clean Water Act of 1948, and the Forest and Rangeland Renewable Resources Planning Act of 1974.

Travel Management Rule (36 CFR 212, 251, 261, and 295): The KNF Motorized Travel Management EIS is designed specifically to implement the requirements of the November 5, 2005, Rule for Travel Management, Subpart B.

[b] After the NOI was published, this number was validated and should actually be 119 miles.
[c] After the NOI was published, it was determined that road 40N51 had been opened to public use in an earlier decision.

Decision Framework

The responsible official will decide whether to adopt and implement the proposed action, an alternative to the proposed action, or take no action to prohibit cross-country motor vehicle travel by the public off the designated system.

This proposal does not revisit previous administrative decisions that resulted in the current NFTS. This proposal is focused on implementing 36 CFR 212 Subpart B of the Travel Management Rule. Previous administrative decisions concerning road construction, road reconstruction, trail construction, and land suitability for motorized use on the existing NFTS are outside the scope of this analysis.

Responsible Official

The Forest Supervisor for the Klamath National Forest is the responsible official for this decision and will sign the Record of Decision.

Public Involvement

The interdisciplinary (ID) team relied on public involvement to ensure that a full range of alternatives, representing a broad array of perspectives, would be analyzed. The Forest used a variety of methods to keep the public informed of the route designation process. These methods included: public meetings/workshops, news releases, Forest web page updates, newsletters, phone calls, mailings, and presentations to a variety of service organizations, clubs, Siskiyou County representatives, tribes, and environmental interest groups. The Forest met with the public, tribes, local elected officials, community groups, and individuals since 2005 to discuss the Travel Management Rule and how it will affect travel on the Forest. In addition to individual meetings and discussions, three rounds of public workshops were held in 2005, 2007, and 2008 in communities throughout the planning area. These communities included Happy Camp, Greenview, Yreka, Orleans, and Macdoel. These workshops were held to share information, learn which routes were being used by the public, and assess the recreational value of all known routes. During this process, the public identified 497 miles of unauthorized routes, 2,374 miles of NFTS roads, and 65 acres of concentrated use area being used by motorized vehicles, or with potential to be so used. Information gathered through public involvement was used to assist the ID team in developing the proposed action.

Public scoping period for the Proposed Action

On October 7, 2008, the Forest Service published a Notice of Intent to Prepare an Environmental Impact Statement in the Federal Register (FR Volume 73, Number 195) for the Klamath National Forest Motorized Travel Management project, including a description of the proposed action. The public scoping period began on October 7, 2008, and was to have ended on November 6, 2008;

however, the responsible official elected to extend the scoping period by 30 days in order to ensure that all interested parties would have an opportunity to comment. Newsletters announcing and extending the scoping period were mailed out to all potentially affected landowners and cooperators. The public scoping period ended on December 6, 2008.

Comment period for the DEIS

The DEIS was published on May 21, 2009. The KNF hosted a series of open houses to provide additional information to interested parties and to invite public comments. The comment period ended July 20, 2009. Public comments were utilized to refine the analysis and develop an additional alternative (Alternative 7). Public comments and responses are included in Appendix E of this FEIS. Additional documentation of public involvement can be found in the project planning record located at the Klamath National Forest Supervisor's Office in Yreka CA.

Tribal Consultation

Comments from, and consultation with, federally recognized and other tribes associated with the KNF have been sought during travel management planning. The following ten tribal organizations received information and the opportunity to comment on the proposed action:

Karuk Tribe	Klamath Tribes	Quartz Valley Indian Reservation
Pit River Tribes	Yurok Tribe	Hoopa Tribe
Shasta Indian Nation	Shasta Tribe, Inc.	Confederated Tribes of Siletz Indians
Confederated Tribes of Grand Ronde Community		

Ongoing consultation with tribal governments will continue during implementation of the travel management decision.

Issues

Comments from the public, other agencies, and Native American representatives were used to formulate issues concerning the proposed action. An issue is a matter of public concern regarding the proposed action and its environmental impacts. The Forest Service separated the issues into two groups: significant and non-significant.

Significant Issues

Significant issues were defined as those directly or indirectly caused by implementing the proposed action. The interdisciplinary team developed measurement indicators for each significant issue.

Issue: The Proposed Action unreasonably restricts motorized recreation use by prohibiting cross-country travel.

The addition of 92 miles of unauthorized roads to the NFTS does not provide enough motorized public access to or diversity of motorized recreational opportunity on Klamath National Forest Lands, including loops, connecting scenic destinations, campgrounds, local services, watersheds, and low and high elevation areas.

Discussion: Concerns were raised that restricting cross-country travel across the entire forest severely impacts motorized recreation opportunities and unfairly restricts access for hunting, fishing, camping and a host of other outdoor activities. The route inventory includes 497 miles of public-identified unauthorized routes and the proposed action only retains 92 miles of these. This is insufficient to maintain a quality motorized recreation experience on the Klamath National Forest.

Indicators: The key indicators used to analyze this issue are:

- Acres open to cross-country motorized travel
- Miles of unauthorized routes proposed for addition to the NFTS
- Miles of mixed use (roads on which both highway legal and non-highway legal vehicles can travel) added

Issue: The Forest's current NFTS is too large to provide adequate maintenance and administration, given the existing maintenance backlog.

No new roads should be created as current roads are largely unmaintained.

Discussion: Concerns were expressed that the roads currently on the KNF NFTS are already inadequately maintained and patrolled. Increasing the number of miles open to motorized uses would result in an increased need for maintenance when there is already a backlog that is not being addressed. Additional Forest Service administration would be required to prevent unauthorized uses or resource damage, resolve user conflicts, and provide for public safety.

Indicators: The key indicators used to analyze this issue are:

- Miles of unauthorized routes and acres of areas proposed for addition to the NFTS

- Cost of maintaining routes added to the NFTS

Issue: Some roads proposed for addition to the NFTS are in proximity to wilderness or inventoried roadless areas.

The designation of unauthorized routes near these areas will encourage incursion of motorized use into the wilderness, and impact the ability of people to enjoy a quiet recreation experience.

Discussion: Concerns were raised that wildernesses and inventoried roadless areas on the Klamath National Forest are already impacted by motorized use. The proposed action only compounds this problem by adding motorized routes in proximity to these areas. Opportunities for solitude and non-motorized experiences will be disrupted by the noise of vehicles.

Indicators: The key indicators used to analyze this issue are:

- Number of unauthorized routes proposed for addition to the NFTS within 0.5 mile of wilderness boundaries
- Number of miles of unauthorized routes proposed for addition to the NFTS within 0.5 mile of wilderness boundaries
- Number of unauthorized routes proposed for addition to the NFTS within inventoried roadless areas

Issue: Many of the unauthorized routes proposed for addition to the NFTS are poorly located and would cause adverse impacts to plants, wildlife, water quality, soils, riparian areas and other natural resources.

Discussion: Concerns were expressed about impacts to a variety of natural resources, citing stream crossings, habitat fragmentation, wildlife disturbance, sedimentation, cultural resources, invasive weeds and other resources that would be impacted by motorized use of roads and trails.

Indicators: The key indicators used to analyze this issue are:

- Miles of unauthorized routes and acres of areas proposed for addition to the NFTS in or adjacent to threatened, endangered and sensitive (TES) plant sites or suitable TES plant habitat
- Number of sensitive sites for TES wildlife species within 0.25 miles of an unauthorized route proposed for addition to the NFTS
- Miles of unauthorized routes and acres affected within the habitat for wildlife species groups

- Miles of unauthorized routes and acres of areas proposed for addition to the NFTS in watersheds with habitat for TES fish
- Density of motor vehicle routes (hydrology and wildlife: ungulate group only)
- Number of historic properties within unauthorized routes proposed for addition to the NFTS at risk from ongoing use
- Miles of unauthorized routes proposed for addition to the NFTS within 100 ft. of known noxious weed sites

Non-significant Issues

Non-significant issues were identified as those: (1) outside the scope of the proposed action; (2) already decided by law, regulation, Forest Plan, or other higher level decision; (3) irrelevant to the decision to be made; or (4) conjectural and not supported by scientific or factual evidence. The Council on Environmental Quality (CEQ) NEPA regulations explain this delineation in Sec. 1501.7, "…identify and eliminate from detailed study the issues which are not significant or which have been covered by prior environmental review (Sec. 1506.3)…" A list of non-significant issues raised during public scoping, and reasons why they were found non-significant can be found in the project record located at the Klamath National Forest Supervisors Office in Yreka , CA.

Chapter 2 - The Alternatives

Introduction

This chapter describes and compares the alternatives considered for the Klamath National Forest Motorized Travel Management Environmental Impact Statement (EIS). It describes both alternatives considered in detail and those eliminated from detailed study. The end of this chapter presents the alternatives in tabular format so that the alternatives and their environmental impacts can be readily compared.

Based on the issues identified through public comment on the proposed action, the Forest Service developed five alternative proposals that achieve the purpose and need differently than the proposed action. In addition, the Forest Service is required to analyze a no action alternative. The no action, proposed action, and other action alternatives are described in detail below.

The chapter is divided into four parts:

- Part 1 describes how the alternatives were developed.
- Part 2 presents the alternatives considered in detail.
- Part 3 presents a summary comparison of the alternatives.
- Part 4 presents the alternatives that were considered, but eliminated from detailed analysis. It includes the rationale for eliminating these alternatives.

How the Alternatives were Developed

The proposed action and 5 action alternatives (all 6 subsequently referred to as the action alternatives) were developed to meet the purpose and need and address a range of issues as described in Chapter 1. During the initial planning stages of the KNF travel management project, members of the public recommended changes to the existing National Forest Transportation System (NFTS), focusing on unauthorized routes. Comments regarding specific routes were also received during the public scoping period for the Notice of Intent (NOI).

The KNF interdisciplinary (ID) team screened all the public-identified routes against a variety of resource criteria, and identified those routes that had serious resource concerns or did not meet the purpose and need for the project. Routes were eliminated from further consideration for the following reasons:

- Resource concerns could not be mitigated through application of project design standards

- Resource concerns could not be resolved efficiently and cost-effectively, even with application of design standards (i.e., maintenance costs would be exorbitant)
- The route was a short dead-end spur, and did not provide access to a recreation opportunity
- The only destination for the route was private land
- The route crossed private lands and the KNF could not establish that a right-of-way for public access existed
- The route used an existing equestrian or foot trail. These trails were not designed to accommodate motorized use, and such use would create safety issues and conflicts among users.

The Responsible Official then reviewed the remaining group of routes and used it to develop the alternatives based on the Purpose and Need, the scope, the issues raised by the public, and resource concerns raised by the ID team. Routes that were considered for addition to the NFTS are those that are the most stable, present the fewest resource conflicts, and would require the least amount of modification or maintenance to meet standards, but still provide a diversity of motorized experiences. With a few exceptions, these routes are on relatively flat ground and do not exhibit erosion. Detailed results of this process are available in the project record, housed at the KNF Supervisor's Office in Yreka, CA.

Refining Alternatives Submitted by the Public during Scoping

During the 60 day public scoping process, alternatives were submitted for consideration by 2 groups. After the scoping period concluded, the Forest Service reviewed and gave due consideration to their proposals. The resulting alternatives incorporate these and other proposals and information offered by the public.

Also important in this process was the information gathered by the Forest Service in their consultation and discussions with tribal representatives, local counties, and Forest Service employees. State and federal agencies advised the process through numerous informal contacts.

Alternatives Considered in Detail

Six action alternatives (alternatives 2, 3, 4, 5, 6, and 7) and a no action alternative (Alternative 1) are analyzed in detail in this FEIS. The no action alternative represents the continuation of cross-country travel. This alternative serves as a baseline for comparison among the alternatives, and is required by the implementing regulations of the National Environmental Policy Act (NEPA).

The project area for the alternatives includes National Forest System (NFS) lands on the KNF. It does not include any private, state, or other federal lands.

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

Monitoring Applicable to All Action Alternatives

Monitoring is critical for evaluating the effectiveness of management decisions, the accuracy of analysis assumptions, and conclusions. Monitoring of road and trail conditions is required, and must meet regional and national standards. If monitoring determines additional resource damage is occurring from motorized vehicle use, steps to prevent further damage may be taken. If the mitigations are not effective or are not possible, road or trail closures may be needed. This could require additional NEPA analysis. Based on consultation with the National Marine Fisheries Service (NMFS), the condition of two stream crossings in the Middle Fork Humbug Creek (on 7H002.2 and 7H002.4) will be monitored for 5 years.

Once a route is added to the NFTS as a road, it will be subject to the monitoring program used for the NFTS. Condition surveys are regularly performed on ML 3, 4, and 5 roads to assure road user safety. Conditions on ML2 roads are monitored regularly as they are driven for other purposes. As problems are identified, they are addressed as resources allow, and appropriate management actions (such as emergency closures) are undertaken in accordance with law, regulation and policy. ML 1 roads are monitored as necessary for drainage and to ensure closure devices are intact.

A separate monitoring effort will be applied to motorized trails and open riding areas. At a minimum, 20 percent of the trails and one open riding area will be monitored every year to identify sites that lack adequate water control or are experiencing damage to the facility (tread) and causing unacceptable effects on soil and water. The KNF intends to apply for grants from the State of California Off-Highway Motor Vehicle Recreation Division to supplement appropriated funds for maintenance. If the grants are secured, monitoring will be conducted annually in compliance with standards set forth in the State's Off-Highway Motor Vehicle Recreation Grants and Cooperative Agreements Program Regulations.

Monitoring of potential effects to heritage sites will be conducted as prescribed in the Programmatic Agreement among the U.S.D.A. Forest Service, Pacific Southwest Region, U.S.D.A. Forest Service, Intermountain Region's Humboldt-Toiyabe National Forest, California State Historic Preservation Officer, and Advisory Council on Historic Preservation Regarding the Process for Compliance with Section 106 of the National Historic Preservation Act for Designating Motor Vehicle Routes and Managing Motorized Recreation on the National Forests in California (Motorized Recreation PA). For action alternatives, establishment of baseline data through long term monitoring will be completed per recommendations in the PA.

Monitoring for effects on the social and economic environments will be based on information generated by the recurring National Visitor Use Monitoring surveys. These surveys provide data related to use of KNF facilities and economic investment of users. Effects on the social environment are more difficult to measure. As opportunities for recreational activities change, so may the lifestyles, attitudes, values and beliefs of user groups. Maintaining working relationships with user groups and following public involvement procedures should provide an appropriate means of understanding changes in the social environment in the future.

One aspect of the social environment that has been highlighted is the satisfaction of residents on private land adjacent to the KNF. This aspect can be monitored through future comments and complaints from this group. Concentrated use of routes, and the resulting safety and satisfaction of all motorized vehicle users, can be monitored by accident reports and comments or complaints from users.

Monitoring of other resource impacts is part of LRMP implementation monitoring. Results of such monitoring are included in the annual Klamath National Forest Monitoring Report and the Best Management Practices Evaluation Process report on the KNF website.

Mitigations Applicable to All Action Alternatives

- All NFTS roads and trails that are available for public use will be signed on the ground with a road or trail number and any regulatory information that may apply to the route. Where necessary for open riding areas, perimeter signing will be installed.
- Stream or channel crossings and approaches will be rocked; approach angles will be modified as needed. The minimum amount of vegetation will be removed consistent with safety and rocking needs.
- Wilderness boundaries will be clearly signed when any road approaches within ¼ mile.
- Limited physical restoration, barricading, and naturalization treatments may occur at the point of closure for unauthorized routes not included in the NFTS. These actions are authorized under the action alternatives without further NEPA, as long as the following conditions are met:
  - Ground disturbance is limited to the currently impacted surface of the unauthorized road or trail.
  - Natural materials, if needed for blocking or restoring the surface, are either gathered within close proximity (approximately 30 feet) of the route edge, or imported from a site covered under a separate site-specific NEPA decision.

- Adequate site clearance is conducted to ensure no natural or cultural resources will be negatively affected by the work in the immediate vicinity of the planned activities.

- Seasons of use will be implemented on some roads and motorized trails to accommodate a variety of resource concerns:

  - Deer winter range: May 1 – October 30

  - Public Safety – separation of uses (separate snowmobiles from motorized vehicles other than over-snow vehicles): May 1 – December 25

  - Swainson's hawk nest site (other than on the BVNG): August 16 - April 14

- If unauthorized routes are designated, they will be brought up to standard (where necessary) prior to use by the public. Such activities may include surface repair, brushing out, construction of drainage structures such as water bars or rolling dips, and grading. All work will be confined to the area currently disturbed by the unauthorized route. The details on the routes and mitigations are listed in appendix A.

- Share-the-Road signs will be installed on ML 3 roads selected for mixed use to inform drivers of highway-legal vehicles that the route is open for use by non-highway-legal vehicles

- Adequate stopping sight distance on curves of mixed use roads will be maintained by brushing as needed.

- Mixed use roads will be closed to non-highway legal vehicles and/or other traffic through use of a Forest Order when commercial traffic (e.g. logging or chip trucks) is scheduled.

- Routes through ultramafic rock proposed for mixed use have been tested for the presence of asbestos. Asbestos is not present in quantities beyond the threshold deemed unsafe for motorized use of rural routes. Therefore, the KNF will not provide additional information to the public regarding safe use of these roads and methods for reducing exposure.

- Alternatives 5 & 6 only: One cultural resource site near a route will be visually screened by placement of cut vegetation, and will receive a complete item-by-item inventory.

Implementation of the above work would not preclude future management decisions made after conducting appropriate site-specific analysis under NEPA (such as converting a NFTS road or trail to a mountain bike trail or more extensive decommissioning of the route, using heavy machinery, etc.), if the need for such actions was deemed necessary.

As soon as practical after the completion of this plan, a Motor Vehicle Use Map (MVUM) will be created and made available to the public at no cost. This map is the legal document designating which routes on the Forest may be legally traveled with a motorized vehicle, by what

type of vehicle, and any seasonal or other use restrictions. Designation of routes, use restrictions, and operating conditions may be revised in future decisions as needed to meet changing conditions or management strategies. As changes or corrections are made to the transportation system, the MVUM will be periodically revised and reissued.

Descriptions of the Alternatives

This section describes each of the seven alternatives considered in detail. Each alternative is described in six parts:

1) **Prohibition of cross-country travel**: All of the action alternatives prohibit motor vehicle travel off designated NFTS roads, NFTS motorized trails, and areas by the public except as allowed by permit or other authorization. Prohibition of cross-country travel is included in order to address the need to regulate unmanaged motor vehicle use.
2) **Forest Plan Amendment**: All of the action alternatives include a non-significant amendment to the Klamath NF Land and Resource Management Plan (LRMP) to address the need to conform with the Travel Management Rule, Subpart B (36 CFR 212). The amendment includes the following components:

- Amend forest-wide standard and guideline 12-11 to read: "Prohibit motorized vehicle travel (with the exception of snowmobiles) off designated roads, trails and open riding areas except as allowed by the motor vehicle use map, permit, or other authorization."
- Amend Table 4-1 to read "Open Riding Areas (acres), Roads and Trails (miles)", and include the number of acres and miles available to OHV use from the selected alternative.

Alternative 7 includes a second amendment (described under that alternative)

3) **Addition of Unauthorized Routes as Roads**: Some action alternatives would add unauthorized routes as roads to the NFTS by vehicle class and season of use. Additions are considered in order to respond to the need to provide motor vehicle access to dispersed-recreation areas, and to provide a diversity of motorized recreation opportunities. For purposes of this analysis, each of these routes is identified by a unique number, and each has a proposed road management objective (RMO). Each route is individually addressed in Appendix A, which includes the permitted season of use.

4) **Addition of Unauthorized Routes as Motorized Trails**: Some action alternatives would add unauthorized routes as motorized trails to the NFTS by vehicle class and season of use. Additions are considered in order to respond to the need to provide a diversity of motorized recreation opportunities. For purposes of this analysis, each of these routes is identified by a unique number, and each has a proposed trail management objective (TMO). Each trail is individually addressed in Appendix A, which includes the permitted seasons of use .

5) **Motorized Open Riding Area Additions**: Some action alternatives include proposals of discrete, specifically delineated open riding areas for motor vehicle use. Additions are considered in order to respond to the need to provide a diversity of motorized recreation opportunities. For purposes of this analysis, each proposed area is identified by name, size (acreage), and season of use.

6) **Changes to NFTS**: a) Vehicle class - The action alternatives may include limited changes to the vehicle class allowed on existing NFTS roads. Vehicle class indicates the type of vehicle (passenger car, motorcycle, all-terrain vehicle, etc.) permitted to travel on a road or trail. Some alternatives may add vehicle classes to roads where that use is currently prohibited to increase motorized vehicle opportunities. Some alternatives may remove vehicle classes from roads where that use is currently allowed to respond to the needs of adjacent landowners. b) Opening closed roads – Some alternatives include opening one or two NFTS roads to public use where such use is currently prohibited to enhance motorized recreation by creating a loop opportunity. These changes respond to the need to provide a diversity of motorized recreation opportunities and access. c) Maintenance Levels – Alternative 7 includes changing maintenance levels (from ML3 to ML2) per recommendations in the Mixed Use Analysis. d) Season of Use - While the direction guiding development of this project allowed for changing season of use on NFTS roads, the alternatives analyzed in this document do not include any such proposals. Changes in season of use on NFTS roads are not further addressed.

Alternative 1

The no action alternative provides a baseline for comparing the other alternatives. Under the no action alternative, no changes would be made to the NFTS and there would be no prohibition of cross-country travel (see Table 2-1). Current management plans would continue to guide project area management. The Travel Management Rule would not be implemented, and no motor vehicle use map (MVUM) would be published. Motor vehicle travel by the public would not be limited to designated routes. Unauthorized routes would continue to proliferate and would have no status or authorization as NFTS facilities.

1) **Cross-country travel**: Public motor vehicle travel off designated NFTS roads, NFTS trails, and outside designated motorized use areas would continue except as otherwise prohibited.

2) **Forest Plan Amendment**: The Klamath Forest Plan would not be amended to conform to the Travel Management Rule, Subpart B.

3) **Additions of roads**: No unauthorized routes would be added to the NFTS as roads under this alternative.

4) **Additions of motorized trails**: No unauthorized routes would be added to the NFTS as motorized trails under this alternative.

5) **Motorized open riding area additions**: No motorized open riding areas would be added under this alternative.

6) **Changes to the NFTS**: a) Vehicle class - No change would be made to the NFTS vehicle class under this alternative. b) Opening closed roads – No roads currently closed would be opened. c) Changing Maintenance Level (from ML 3 to ML 2) per recommendations in the Motorized Mixed Use Analysis – none proposed under this alternative.

Table 2-1 displays a summary of the actions proposed in this alternative. A map displaying this alternative is included in digital format on the CD attached to this document, and may be found in the project record located at the Klamath National Forest Supervisors Office in Yreka CA.

Table 2-1. Alternative 1 - summary of actions

Action type	Action proposed
1. Cross-country motorized travel	**Permitted on 1.2 million ac.**
2. Forest Plan Amendments	**0**
3. Additions of Roads to the NFTS	**0 miles**
Roads added to access dispersed recreation sites – open to all vehicles	0 miles
Roads added to provide a diversity of motorized recreation opportunities:	
open to all vehicles	0 miles
# of roads/miles with season of use May 1 – October 31	0 / 0miles
# of roads/miles with season of use August 16 - April14	0 / 0 miles
4a. Additions of Motorized Trails to the NFTS by Type of Vehicle	**0 miles**
Motorcycle Only	0 miles
All Trail Vehicles	0 miles
All Vehicle Types	0 miles
Vehicles 50" or less in width	0 miles
4b. Additions of Motorized Trails to the NFTS by Season of Use	**0 miles**
# of trails/miles with season of use May 1 - October 31	0 / 0 miles
# of trails/miles with year round use	0 / 0 miles
5. Motorized Open Riding Areas added	**0 acres**
Juniper Flat	0 acres
Humbug	0 acres
6. Changes to the NFTS	
Vehicle Class:	
ML 3 – Open to both highway licensed & non-highway licensed vehicles	0 miles
ML 2 - Open to highway licensed vehicles only (mixed use removed)	0 miles
Convert ML 1 roads to ML 2 (open to all vehicles)	0 miles
Convert ML 3 roads to ML 2 (open to all vehicles)	0 miles

Alternative 2

The proposed action was developed by an ID team using input on public-identified inventoried unauthorized routes, maintenance level (ML) 1 roads, and mixed use on ML 3 roads. It includes proposals to prohibit cross-country motorized travel, change the existing NFTS, and add to the NFTS as described in the Notice of Intent (NOI) published October 7, 2008 (Volume 73, Number 195).

1. **Cross-country travel**: Public motor vehicle travel off designated NFTS roads, NFTS trails, and outside designated motorized open riding areas would be prohibited, except as allowed by permit or other authorization.

2. **Forest Plan Amendment**: The Klamath Forest Plan would be amended to conform to the Travel Management Rule, Subpart B.

3. **Additions of roads**: Under this alternative, 258 unauthorized routes totaling 24 miles would be added to the NFTS as roads to access dispersed recreation sites; 84 unauthorized routes totaling 54 miles would be added to the NFTS as roads to provide a diversity of motorized recreation opportunities.

4. **Additions of motorized trails**: 22 unauthorized routes for a total of 14 miles would be added to the NFTS as motorized trails.

5. **Motorized open riding area additions**: 2 motorized open riding areas would be added under this alternative, the Humbug Open Riding Area of 5 acres and the Juniper Flat Open Riding Area of 60 acres for a total of 65 acres.

6. **Changes to the NFTS**: a) Vehicle class – i) vehicle class would be changed on portions or all of 24 roads from highway-legal only, to both highway-legal and non-highway-legal allowed (allow mixed use). ii) Vehicle class would be changed on portions or all of 8 roads from both highway-legal and non-highway-legal, to highway-legal only allowed (prohibit mixed use). b) Opening closed roads – Two currently closed ML 1 roads would be opened. c) Changing Maintenance Level (from ML 3 to ML 2) per recommendations in the Motorized Mixed Use Analysis – none proposed under this alternative.

Table 2-2 displays a summary of the actions proposed in this alternative. A complete listing of roads, trails, and open riding areas to be added to the NFTS (including the vehicle class and, if applicable, season of use) can be found in Appendix A. A map displaying this alternative is included in digital format on the CD attached to this document, and may be found in the project record located at the Klamath National Forest Supervisors Office in Yreka CA.

Table 2-2. Alternative 2 - summary of actions

Action type	Action proposed
1. Cross-country motorized travel	**Prohibited on 1.2 million ac.**
2. Forest Plan Amendments	**1**
Prohibit cross-country motorized travel	
3. Additions of Roads to the NFTS	**78 miles**
Roads added to access dispersed recreation sites – open to all vehicles	23 miles
Roads added to provide a diversity of motorized recreation opportunities:	
open to all vehicles	54 miles
# of roads/miles with season of use May 1 – October 31	13 / 7.29miles
# of roads/miles with season of use August 16 - April14	1 / 1.43 miles

Action type	Action proposed
4a. Additions of Motorized Trails to the NFTS by Type of Vehicle	**14 miles**
Motorcycle Only **All Trail Vehicles** **All Vehicle Types** **Vehicles 50" or less in width**	3.77 miles 1.91 miles 0.18 miles 8.29 miles
4b. Additions of Motorized Trails to the NFTS by Season of Use	**14 miles**
# of trails/miles with season of use May 1-October 31 **# of trails/miles with year round use**	18 / 13.02 miles 4/ 1.13 miles
5. Motorized Open Riding Areas added	**65 acres**
Juniper Flat **Humbug**	60 acres 5 acres
6. Changes to the NFTS	
Vehicle Class: **ML3 – Open to both highway licensed & non-highway licensed vehicles** **ML2 – Open to highway licensed vehicles only (mixed use removed)** **Convert ML 1 roads to ML 2 (open to all vehicles)** **Convert ML 3 roads to ML 2 (open to all vehicles)**	 88 miles[a] 10 miles 9.96 miles 0 miles

a - After the NOI was published, this number was validated and should actually be 119 miles. Specialists analyzed all the proposed mixed use roads using the larger numbers, so the mileages listed in the Resource sections may conflict with this value.

Alternative 3

Alternative 3 would prohibit cross-country travel, and proposes no new additions to the NFTS. This alternative also provides a baseline for comparing the impacts of other alternatives that propose changes to the NFTS. None of the unauthorized roads, trails, or areas would be added to the NFTS. Alternative 3 also responds to issues 2-4 (cost, maintenance, wilderness, quiet use, and natural resource impacts).

1. **Cross-country travel:** Public motor vehicle travel off designated NFTS roads, NFTS trails, and outside designated motorized use areas would be prohibited, except as allowed by permit or other authorization.

2. **Forest Plan Amendment:** The Klamath Forest Plan would be amended to conform to the Travel Management Rule, Subpart B.

3. **Additions of roads:** No unauthorized routes would be added to the NFTS as roads under this alternative.

4. **Additions of motorized trails:** No unauthorized routes would be added to the NFTS as motorized trails under this alternative.

5. **Motorized open riding area additions:** No motorized open riding areas would be added under this alternative.

6. **Changes to the NFTS:** a) Vehicle class - No changes would be made to the NFTS vehicle classes under this alternative. b) Opening closed roads – No roads currently closed would be

opened. c) Changing Maintenance Level (from ML 3 to ML 2) per recommendations in the Motorized Mixed Use Analysis – none proposed under this alternative.

Table 2-3 displays a summary of the actions proposed in this alternative. A complete listing of roads, trails, and areas to be added to the NFTS (including the vehicle class and, if applicable, season of use) can be found in Appendix A. A map displaying this alternative is included in digital format on the CD attached to this document, and may be found in the project record located at the Klamath National Forest Supervisors Office in Yreka CA.

Table 2-3. Alternative 3- summary of actions

Action type	Action proposed
1. Cross-country travel	**Prohibited on 1.2 million ac.**
2. Forest Plan Amendments	**1**
Prohibit cross-country motorized travel	
3. Additions of Roads to the NFTS	**0 miles**
Roads added to access dispersed recreation sites – open to all vehicles **Roads added to provide a diversity of motorized recreation opportunities:** **open to all vehicles** **# of roads/miles with season of use May 1 – October 31** **# of roads/miles with season of use August 16 - April14**	0 miles 0 miles 0 / 0miles 0 / 0 miles
4a. Additions of Motorized Trails to the NFTS by Type of Vehicle	**0 miles**
Motorcycle Only **All Trail Vehicles** **All Vehicle Types** **Vehicles 50" or less in width**	0 miles 0 miles 0 miles 0 miles
4b. Additions of Motorized Trails to the NFTS by Season of Use	**0 miles**
# of trails/miles with season of use May 1-October 31 **# of trails/miles with year round use**	0 / 0 miles 0 / 0 miles
5. Motorized Open Riding Areas added	**0 acres**
Juniper Flat **Humbug**	0 acres 0 acres
6. Changes to the NFTS	
Vehicle Class: **ML3 – Open to both highway licensed & non-highway licensed vehicles** **ML2 – Open to highway licensed vehicles only (mixed use removed)** **Convert ML 1 roads to ML 2 (open to all vehicles)** **Convert ML 3 roads to ML 2 (open to all vehicles)**	0 miles 0 miles 0 miles 0 miles

Alternative 4

Alternative 4 responds to issues 2-4 (cost, maintenance, wilderness, quiet use, and natural resource impacts) by prohibiting cross-country travel and adding a few routes to the NFTS.

1) **Cross-country travel**: Public motor vehicle travel off designated NFTS roads, NFTS trails, and outside designated motorized use areas would be prohibited, except as allowed by permit or other authorization.

2) **Forest Plan Amendment**: The Klamath Forest Plan would be amended to conform to the Travel Management Rule, Subpart B.

3) **Additions of roads**: Under this alternative, 25 unauthorized routes totaling less than 2 miles would be added as roads to the NFTS for accessing dispersed recreation sites; 12 unauthorized routes totaling 4 miles would be added as roads to the NFTS to provide a diversity of motorized recreation opportunities.

4) **Additions of motorized trails**: Two unauthorized routes for a total of less than 1 mile would be added as motorized trails to the NFTS.

5) **Motorized open riding area additions**: No motorized open riding areas would be added under this alternative.

6) **Changes to the NFTS**: a) Vehicle class – i) Vehicle class would be changed on portions or all of 25 roads from highway-legal only, to both highway-legal and non-highway-legal allowed (allow mixed use). ii) Vehicle class would be changed on portions or all of 6 roads from both highway-legal and non-highway-legal, to highway-legal only allowed (prohibit mixed use). b) Opening closed roads – No currently closed roads would be opened. c) Changing Maintenance Level (from ML 3 to ML 2) per recommendations in the Motorized Mixed Use Analysis – none proposed under this alternative.

Table 2-4 displays a summary of the actions proposed in this alternative. A complete listing of roads, trails and areas to be added into the NFTS (including the vehicle class and, if applicable, season of use) can be found in appendix A. A map displaying this alternative is included in digital format on the CD attached to this document, and may be found in the project record located at the Klamath National Forest Supervisors Office in Yreka CA.

Table 2-4. Alternative 4 - summary of actions

Action type	Action proposed
1. Cross-country travel	**Prohibited on 1.2 million ac.**
2. Forest Plan Amendments	**1**
Prohibit cross-country motorized travel	
3. Additions of Roads to the NFTS	**6 miles**
Roads added to access dispersed recreation sites – open to all vehicles	2 miles
Roads added to provide a diversity of motorized recreation opportunities:	
open to all vehicles	4 miles
# of roads/miles with season of use May 1 – October 31	0 / 0miles
# of roads/miles with season of use August 16 - April14	0 / 0 miles
4a. Additions of Motorized Trails to the NFTS by Type of Vehicle	**1 mile**
Motorcycle Only	0 miles
All Trail Vehicles	0.73 miles
All Vehicle Types	0 miles
Vehicles 50" or less in width	0 miles
4b. Additions of Motorized Trails to the NFTS by Season of Use	**1 mile**
# of trails/miles with season of use May 1-October 31	0 / 0 miles
# of trails/miles with year round use	2 / 0.73 miles

Action type	Action proposed
5. Motorized Open Riding Areas added	**0 acres**
Juniper Flat **Humbug**	0 acres 0 acres
6. Changes to the NFTS	
Vehicle Class : **ML3 – Open to both highway licensed & non-highway licensed vehicles** **ML2 – Open to highway licensed vehicles only (mixed use removed)** **Convert ML 1 roads to ML 2 (open to all vehicles)** **Convert ML 3 roads to ML 2 (open to all vehicles)**	 119 miles 7.66 miles 0 miles 0 miles

Alternative 5

Alternative 5 responds to the first significant issue from Chapter 1 (amount of access and motorized recreation opportunity). This alternative is based on alternative 6, with additional routes and mixed use to provide more access and motorized recreation opportunity.

1) **Cross-country travel:** Public motor vehicle travel off designated NFTS roads, NFTS trails, and outside designated motorized use areas would be prohibited, except as allowed by permit or other authorization.

2) **Forest Plan Amendment:** The Klamath Forest Plan would be amended to conform to the Travel Management Rule, Subpart B.

3) **Additions of roads:** Under this alternative, 206 unauthorized routes totaling 30 miles would be added as roads to the NFTS for accessing dispersed recreation sites; 29 unauthorized routes totaling 17 miles would be added as roads to the NFTS to provide a diversity of motorized recreation opportunities.

4) **Additions of motorized trails:** 33 unauthorized routes for a total of 22 miles would be added as motorized trails to the NFTS.

5) **Motorized open riding area additions:** Two motorized open riding areas would be added under this alternative, the Humbug Open Riding Area of 5 acres and the Juniper Flat Open Riding Area of 48 acres for a total of 53 acres.

6) **Changes to the NFTS**: a) Vehicle class – i) Vehicle class would be changed on portions or all of 272 roads from highway-legal only, to both highway-legal and non-highway-legal allowed (allow mixed use). ii) Vehicle class would be changed on portions or all of 7 roads from both highway-legal and non-highway-legal, to highway-legal only allowed (prohibit mixed use). b) Opening closed roads – One currently closed ML 1 road would be opened. c) Changing Maintenance Level (from ML 3 to ML 2) per recommendations in the Motorized Mixed Use Analysis – none proposed under this alternative.

Table 2-5 displays a summary of the actions proposed in this alternative. A complete listing of roads, trails, and areas to be added to the NFTS (including the vehicle class and, if applicable, season of use) can be found in Appendix A. A map displaying this alternative is included in digital format on the CD attached to this document, and may be found in the project record located at the Klamath National Forest Supervisors Office in Yreka CA.

Table 2-5. Alternative 5 - summary of actions

Action type	Action proposed
1. Cross-country travel	**Prohibited on 1.2 million ac.**
2. Forest Plan Amendments	**1**
Prohibit cross-country motorized travel	
3. Additions of Roads to the NFTS	**48 miles**
Roads added to access dispersed recreation sites – open to all vehicles **Roads added to provide a diversity of motorized recreation opportunities:** **open to all vehicles** **# of roads/miles with season of use May 1 – October 31** **# of roads/miles with season of use August 16 - April14**	30 miles 17 miles 4 / 0.68miles 1 / 1.43 miles
4a. Additions of Motorized Trails to the NFTS by Type of Vehicle	**22 miles**
Motorcycle Only **All Trail Vehicles** **All Vehicle Types** **Vehicles 50" or less in width**	3.82 miles 4.49 miles 0 miles 13.46 miles
4b. Additions of Motorized Trails to the NFTS by Season of Use	**22 miles**
# of trails/miles with season of use May 1-October 31 **# of trails/miles with year round use**	31 / 21.33 miles 1 / 0.44 miles
5. Motorized Open Riding Areas added	**53 acres**
Juniper Flat **Humbug**	48 acres 5 acres
6. Changes to the NFTS	
Vehicle Class: **ML3 – Open to both highway licensed & non-highway licensed vehicles** **ML2 – Open to highway licensed vehicles only (mixed use removed)** **Convert ML 1 roads to ML 2 (open to all vehicles)** **Convert ML 3 roads to ML 2 (open to all vehicles)**	 272 miles 7.66 miles 4.66 miles 0 miles

Alternative 6

The original proposed action was developed to meet the purpose and need described in the October 7, 2008 Notice of Intent. Additional field reconnaissance and analysis of the existing data led to refinement of the proposed action. These refinements include:

- Removing routes that are overgrown and/or show no sign of use, do not meet the purpose and need, do not meet policy, or are inaccessible.
- Removing an invalid polygon in T43N R4W S26 MDM.
- Correcting the designation of the Long Gulch road from a ML 3 NFTS road to a county road.

- Correcting the designation of road 40N51 from closed to open.
- Adding several unauthorized routes as roads and motorized trails to make loops.
- Extending the area of proposed mixed use on ML 3 roads to connect loops.
- Updating the number of roads and total mileage proposed for mixed use.
- Adding a season of use to the Humbug open riding area of May 1-October 31.
- Correcting the vehicle class for developed river access along Highway 96 to highway-legal only.

This alternative includes:

1) Cross-country travel: Public motor vehicle travel off designated NFTS roads, NFTS trails, and outside designated motorized use areas would be prohibited, except as allowed by permit or other authorization.

2) Forest Plan Amendment: The Klamath Forest Plan would be amended to conform to the Travel Management Rule, Subpart B.

3) Additions of roads: Under this alternative, 164 unauthorized routes totaling 26 miles would be added as roads to the NFTS for accessing dispersed recreation sites; 26 unauthorized routes totaling 15 miles would be added as roads to the NFTS to provide a diversity of motorized recreation opportunities.

4) Additions of motorized trails: Thirty unauthorized routes for a total of 18 miles would be added as motorized trails to the NFTS.

5) Motorized open riding area additions: Two motorized open riding areas would be added under this alternative, the Humbug Open Riding Area of 5 acres and the Juniper Flat Open Riding Area of 48 acres for a total of 53 acres.

6) Changes to the NFTS: a) Vehicle class – i) vehicle class would be changed on portions or all of 21 roads from highway-legal only, to both highway-legal and non-highway-legal allowed (allow mixed use). ii) vehicle class would be changed on portions or all of 7 roads from both highway-legal and non-highway-legal, to highway-legal only allowed (prohibit mixed use). b) Opening closed roads – 1 currently closed ML 1 road would be opened. c) Changing Maintenance Level (from ML 3 to ML 2) per recommendations in the Motorized Mixed Use Analysis – none proposed under this alternative.

Table 2-6 displays a summary of the actions proposed in this alternative. A complete listing of roads, trails, and areas to be added to the NFTS (including the vehicle class and, if applicable, season of use) can be found in Appendix A. A map displaying this alternative is included in

digital format on the CD attached to this document, and may be found in the project record located at the Klamath National Forest Supervisors Office in Yreka CA.

Table 2-6. Alternative 6 - summary of actions

Action type	Action proposed
1. Cross-country travel	**Prohibited on 1.2 million ac.**
2. Forest Plan Amendments	**1**
Prohibit cross-country motorized travel	
3. Additions of Roads to the NFTS	**41 miles**
Roads added to access dispersed recreation sites – open to all vehicles **Roads added to provide a diversity of motorized recreation opportunities:** **open to all vehicles** **# of roads/miles with season of use May 1 – October 31** **# of roads/miles with season of use August 16 - April14**	25 miles 14 miles 3 / 0.33miles 1 / 1.43 miles
4a. Additions of Motorized Trails to the NFTS by Type of Vehicle	**18 miles**
Motorcycle Only **All Trail Vehicles** **All Vehicle Types** **Vehicles 50" or less in width**	3.61 miles 4.49 miles 0 miles 10.35 miles
4b. Additions of Motorized Trails to the NFTS by Season of Use	**18 miles**
# of trails/miles with season of use May 1-October 31 **# of trails/miles with year round use**	28 / 17.98 miles 1 / 0.44 miles
5. Motorized Open Riding Areas added	**53 acres**
Juniper Flat **Humbug**	48 acres 5 acres
6. Changes to the NFTS	
Vehicle Class : **ML3 – Open to both highway licensed & non-highway licensed vehicles** **ML2 – Open to highway licensed vehicles only (mixed use removed)** **Convert ML 1 roads to ML 2 (open to all vehicles)** **Convert ML 3 roads to ML 2 (open to all vehicles)**	 105 miles 7.66 miles 4.66 miles 0 miles

Alternative 7

Alternative 7 is based on responding to the public comment on the DEIS, additional field reconnaissance and analysis of the existing data, and corrections of errors. These responses and corrections include those proposed in Alternative 6 of the DEIS and the following:

- Adding 3 unauthorized routes as roads available for highway legal vehicles only (12.8 miles) in the Butte Valley National Grassland (BVNG) that had inadvertently been omitted from the action alternative maps. Further information on the Butte Valley National Grassland is provided in the Affected Environment section of Chapter 3.

- Clarifying the difference between routes that access dispersed recreation sites (short spurs less than ½ mile each) and other routes to provide a variety of recreational experience by type of vehicle likely to use each type of route.

- Removing from consideration 3 routes to dispersed recreation sites and one route (0.22) previously proposed as a road due to field review which indicated additional resource concerns.
- Removing from consideration 3 routes previously proposed as motorized trails (1.34 miles) that were determined to be inappropriate for designation due to field review that indicated lack of connectivity with other roads, proposed roads, or proposed trails, because their location was not clearly evident on the ground, or due to resource concerns with a stream crossing; identifying one trail (0.75 miles) for vehicles 50" or less in width.
- Implementing the results of the Motorized Mixed Use Analysis to convert 130 miles of ML 3 road to ML 2 and allow non-highway legal vehicle use on 131 miles of ML 3 road.

This alternative includes:

1) **Cross-country travel:** Public motor vehicle travel off designated NFTS roads, NFTS trails, and outside designated motorized open riding areas would be prohibited, except as allowed by permit or other authorization.

2) **Forest Plan Amendments: (1)** the KNF LRMP would be amended to conform to the Travel Management Rule, Subpart B; and (2) the KNF LRMP would be amended to exempt 3 routes added to the NFTS in the BVNG from the seasonal restriction in Forest-wide Standard and Guideline (S&G) 8-37.

3) **Additions of roads:** Under this alternative, 192 unauthorized routes totaling 25.09 miles would be added as roads to the NFTS for accessing dispersed recreation sites; 32 unauthorized routes totaling 28.33 miles would be added to the NFTS to provide a diversity of motorized recreation opportunities (29 routes totaling 14 miles open to all types of motorized vehicles and 14 miles open to highway-legal vehicles only; 13 of the latter on the Butte Valley National Grassland).

4) **Additions of motorized trails**: Twenty-eight unauthorized routes for a total of 20.59 miles would be added as motorized trails to the NFTS.

5) **Motorized open riding area additions:** Two motorized open riding areas would be added under this alternative, the Humbug Open Riding Area of 5 acres and the Juniper Flat Open Riding Area of 48 acres for a total of 53 acres.

6) **Changes to the NFTS:** a) Vehicle class – i) vehicle class would be changed on portions or all of 14 roads from highway-legal only to both highway-legal and non-highway-legal allowed (allow mixed use) for a total of 131 miles, ii) vehicle class would be changed on portions or all of 7 roads for a total of 8 miles from both highway-legal and non-highway-legal, to highway-legal only allowed (prohibit mixed use); b) Opening closed roads – 1 currently

closed ML 1 road would be opened; c) Changing maintenance level (from ML 3 to ML 2) per recommendations in the Motorized Mixed Use Analysis on 130 miles of 18 roads. While the templates guiding development of this project allow for changing season of use on NFTS roads, the alternatives analyzed in this document do not include any such proposals.

Table 2-7 displays a summary of the actions proposed in this alternative. A complete listing of roads, trails, and areas to be added to the NFTS (including the vehicle class and, if applicable, season of use) can be found in Appendix A. A map displaying this alternative is included in digital format on the CD attached to this document, and may be found in the project record located at the Klamath National Forest Supervisors Office in Yreka CA.

Table 2-7. Alternative 7 - summary of actions

Action type	Action proposed
1. Cross-country travel	**Prohibited on 1.2 million ac.**
2. Forest Plan Amendments	**2**
Prohibit cross-country motorized travel **Exempt 3 roads in BVNG from restrictions in forest-wide S&G 8-37**	
3. Additions of Roads to the NFTS	**53 miles**
Roads added to access dispersed recreation sites – open to all vehicles **Roads added to provide a diversity of motorized recreation opportunities:** **open to highway legal vehicles only** **# of roads/miles with season of use May 1 – October 31** **# of roads/miles with season of use August 16 - April14**	24 miles 14 miles 4 / 0.68miles 0 / 0 miles
4a. Additions of Motorized Trails to the NFTS by Type of Vehicle	**21 miles**
Motorcycle Only **All Trail Vehicles** **All Vehicle Types** **Vehicles 50" or less in width**	3.82 miles 3.44 miles 0 miles 13.33 miles
4b. Additions of Motorized Trails to the NFTS by Season of Use	**21 miles**
# of trails/miles with season of use May 1-October 31 **# of trails/miles with year round use**	27 / 20.15 miles 1 / 0.44 miles
5. Motorized Open Riding Areas added	**53 acres**
Juniper Flat **Humbug**	48 acres 5 acres
6. Changes to the NFTS	
Vehicle Class **ML3 – Open to both highway licensed & non-highway licensed vehicles** **ML2 – Open to highway licensed vehicles only (mixed use removed)** **Convert ML 1 roads to ML 2 (open to all vehicles)** **Convert ML 3 roads to ML 2 (open to all vehicles)**	 131 miles* 7.66 miles 4.66 miles 130 miles

*This number does not include the mileage of ML 3 roads that were recommended for conversion to ML 2 in the Motorized Mixed Use Analysis.

Comparison of Alternatives

This section of chapter 2 compares the alternatives by summarizing key differences between the alternatives (Table 2-8) and provides a summary of the effects analysis for all alternatives (Table 2-9). Chapter 3 describes the environmental consequences of the alternatives in detail.

Table 2-8. Comparison of alternatives

Action		Alt. 1	Alt. 2	Alt. 3	Alt. 4	Alt. 5	Alt. 6	Alt. 7
Cross-country Travel		Allowed on 1.2 million acres	Prohibited on 1.2 million acres	Prohibited on 1.2 million acres	Prohibited on 1.2 million acres	Prohibited on 1.2 million acres	Prohibited on 1.2 million acres	Prohibited on 1.2 million acres
Forest Plan Amendment		No	Yes-1	Yes-1	Yes-1	Yes-1	Yes-1	Yes-2
Additions to the NFTS (roads)	**Roads added to access dispersed recreation sites (routes)**	0	258	0	25	206	164	192
	Roads added to access dispersed recreation sites (miles)	0	24	0	1.71	30.56	26.3	25.09
	Other Roads added to provide a diversity of motorized recreation opportunities (routes)	0	84	0	12	29	26	32
	Other Roads added to provide a diversity of motorized recreation opportunities (miles)	0	54	0	4.45	16.69	14.58	28.33
Motorized Trails Added (routes)		0	22	0	2	33	30	28
Motorized Trails Added (miles)		0	14	0	0.73	21.77	18.42	20.59
Motorized Open Riding Areas added		None	Humbug Juniper Flat	None	None	Humbug Juniper Flat	Humbug Juniper Flat	Humbug Juniper Flat
Motorized Open Riding Areas added (acres)		0	65	0	0	53	53	53
Changes to the NFTS	**Mixed Use Added (#)**	0	24	0	25	33	21	14
	Mixed Use Added (miles)	0	88[a]	0	119.25	271.80	105.21	131.45
	Mixed Use Removed (#)	0	8	0	7	7	7	7
	Mixed Use Removed (miles)	0	10	0	7.66	7.66	7.66	7.66
	Open Closed Roads (#)	0	2	0	0	1	1	1

Action		Alt. 1	Alt. 2	Alt. 3	Alt. 4	Alt. 5	Alt. 6	Alt. 7
Changes to the NFTS	Open Closed Roads (miles)	0	9.96	0	0	4.66	4.66	4.66
	Add Mixed Use by Converting ML 3 road to ML 2 (#)	0	0	0	0	0	0	18
	Add Mixed Use by Converting ML 3 road to ML 2 (miles)	0	0	0	0	0	0	130.15
Total Resulting NFTS Roads [b]	ML 1 - ML 5 (miles)	4536	4614	4536	4542	4583	4577	4589

a - After the NOI was published; this number was validated and should actually be 119 miles. Specialists analyzed all the proposed mixed use roads using the 119 figure, so the mileages listed in the Resource sections may conflict with this value.
b - Excluding roads added or removed by ongoing or reasonably foreseeable actions.

Table 2-9. Comparison of environmental effects of alternatives

	Alternative 1	Alternative 2	Alternative 3	Alternative 4	Alternative 5	Alternative 6	Alternative 7
Recreation	Highest mileage and most area available for motorized recreation with least amount of limitations. Greatest access for dispersed rec, highest impacts on quiet recreation activities.	Provides for a diversity of motorized recreation opportunities, including motorized trails and 2 open riding areas. Good access to dispersed sites. Provides substantial benefits for quiet recreation by prohibiting cross-country motorized travel.	Least mileage and area available for motorized use. Does not provide any motorized access to dispersed recreation sites. Highest amount of acreage available for quiet recreation through prohibition of cross-country motorized travel.	Little mileage and no areas available for motorized use; little diversity of motorized access opportunity. Few motorized access routes to dispersed sites. Opportunities for quiet recreation similar to Alt 3.	Provides for a diversity of motorized recreation opportunities, including motorized trails and 2 open riding areas, similar to Alt. 2. Good access to dispersed sites. Provides substantial benefits for quiet recreation by prohibiting cross-country motorized travel.	Provides for a diversity of motorized recreation opportunities, including motorized trails and 2 open riding areas, similar to Alt 2. Good access to dispersed sites. Provides substantial benefits for quiet recreation by prohibiting cross-country motorized travel.	Provides for a diversity of motorized recreation opportunities, including motorized trails and 2 open riding areas, similar to Alt 2. Provides access to birding route on Butte Valley National Grassland. Good access to dispersed sites. Provides substantial benefits for quiet recreation by prohibiting cross-country motorized travel.
Transportation	No safety concerns from mixed use.	Mixed use provided on a variety of roads; higher level of safety concerns for public in mixing types of use.	No safety concerns from mixed use or cross country travel.	Mixed use provided on a variety of roads; higher level of safety concerns for public in mixing types of use.	Mixed use provided on a variety of roads; higher level of safety concerns for public in mixing types of use.	Mixed use provided on a variety of roads; higher level of safety concerns for public in mixing types of use.	Mixed use provided on a variety of roads; higher level of safety concerns for public in mixing types of use. Less mixed use proposed (but similar effects for motorized travel as alternatives 2, 5 and 6) as ML3 roads are converted to ML2.

Society/Economics	Meets demand for off-road travel. Highest potential for dispersed recreation; does not provide for quiet recreation opportunities on land allocations open to cross-country motorized travel. High potential for negative effects from vehicle noise, dust and disturbance to private landowners who live adjacent to NFS lands.	Does not meet demand for off-road driving experience; provides good diversity of motorized opportunity. Provides most motorized access to dispersed recreation sites of any action alternative. Provides high level of quiet recreation opportunities. Beneficial effects for private landowners who live adjacent to NFS lands due to reduced vehicle access and disturbance.	Does not meet demand for off-road driving experience, access to dispersed sites, or diversity of motorized opportunity. Highest amount of acreage available for quiet recreation. Beneficial effects for private landowners who live adjacent to NFS lands due to reduced vehicle access and disturbance.	Does not meet demand for off-road driving experience, limited access to dispersed sites, very limited diversity of motorized opportunity. High amount of acreage available for quiet recreation. Beneficial effects for private landowners who live adjacent to NFS lands due to reduced vehicle access and disturbance.	Does not meet demand for off-road driving experience; provides good diversity of motorized opportunity. Provides high level of motorized access to dispersed recreation. High amount of acreage available for quiet recreation. Beneficial effects for private landowners who live adjacent to NFS lands due to reduced vehicle access and disturbance.	Does not meet demand for off-road driving experience; provides good diversity of motorized opportunity. Provides high level of motorized access to dispersed recreation. High amount of acreage available for quiet recreation. Beneficial effects for private landowners who live adjacent to NFS lands due to reduced vehicle access and disturbance.	Does not meet demand for off-road driving experience; provides good diversity of motorized opportunity. Provides high level of motorized access to dispersed recreation. High amount of acreage available for quiet recreation. Beneficial effects for private landowners who live adjacent to NFS lands due to reduced vehicle access and disturbance.
Visual resources	Potential negative effect on scenery in the long term through potential for new routes that do not meet VQOs.	High positive effect on visual quality through prohibition of cross-country travel. Addition of routes to NFTS is consistent with ROS and VQO designations.	High positive effect on visual quality through prohibition of cross-country travel and long-term visual recovery of routes.	High positive effect on visual quality through prohibition of cross-country travel. Addition of routes to NFTS is consistent with ROS and VQO designations.	High positive effect on visual quality through prohibition of cross-country travel. Addition of routes to NFTS is consistent with ROS and VQO designations.	High positive effect on visual quality through prohibition of cross-country travel. Addition of routes to NFTS is consistent with ROS and VQO designations.	High positive effect on visual quality through prohibition of cross-country travel. Addition of routes to NFTS is consistent with ROS and VQO designations.

Inventoried Roadless Areas	Noise, dust and physical intrusion from cross-country motorized travel continue to adversely affect some roadless characteristics in both IRAs and CIRAs.	Roadless characteristics improve over time as unauthorized routes passively recover to natural conditions. Adding routes to NFTS affects limited acreage in CIRAs.	Roadless characteristics improve over time as unauthorized routes passively recover to natural conditions.	Roadless characteristics improve over time as unauthorized routes passively recover to natural conditions. Adding routes to NFTS affects limited acreage in CIRAs.	Roadless characteristics improve over time as unauthorized routes passively recover to natural conditions. Adding routes to NFTS affects limited acreage in CIRAs.	Roadless characteristics improve over time as unauthorized routes passively recover to natural conditions. Adding routes to NFTS affects limited acreage in CIRAs.	Roadless characteristics improve over time as unauthorized routes passively recover to natural conditions. Adding routes to NFTS affects limited acreage in CIRAs.
Air Resources	Effects on air quality and greenhouse gas emissions are considered neutral, as the total amount of motorized use on the KNF will remain relatively static.	Effects on air quality and greenhouse gas emissions are considered neutral, as the total amount of motorized use on the KNF will remain relatively static.	Effects on air quality and greenhouse gas emissions are considered neutral, as the total amount of motorized use on the KNF will remain relatively static.	Effects on air quality and greenhouse gas emissions are considered neutral, as the total amount of motorized use on the KNF will remain relatively static.	Effects on air quality and greenhouse gas emissions are considered neutral, as the total amount of motorized use on the KNF will remain relatively static.	Effects on air quality and greenhouse gas emissions are considered neutral, as the total amount of motorized use on the KNF will remain relatively static.	Effects on air quality and greenhouse gas emissions are considered neutral, as the total amount of motorized use on the KNF will remain relatively static.
Cultural Resources	Cross-country motorized travel and potential route proliferation negatively affect cultural resources	Prohibition of cross-country motorized travel protects cultural resources on 1.2 million acres of KNF. Addition of routes to NFTS will have no identified negative effects.	Prohibition of cross-country motorized travel protects cultural resources on 1.2 million acres of KNF.	Prohibition of cross-country motorized travel protects cultural resources on 1.2 million acres of KNF. Addition of routes to NFTS will have no identified negative effects.	Prohibition of cross-country motorized travel protects cultural resources on 1.2 million acres of KNF. Addition of routes to NFTS will have no identified negative effects.	Prohibition of cross-country motorized travel protects cultural resources on 1.2 million acres of KNF. Addition of routes to NFTS will have no identified negative effects.	Prohibition of cross-country motorized travel protects cultural resources on 1.2 million acres of KNF. Addition of routes to NFTS will have no identified negative effects.

Geological Resources	3,325 acres of unstable land will be open for off-road motorized travel, increasing potential for landslides. Unrestricted access to 58,000 acres of lands underlain by ultramafic rock (potential exposure to asbestiform dust) and 216 minesites could negatively affect public safety.	Landslide risk would decrease due to prohibition of cross-country travel on 3,325 acres of unstable lands. Public safety would be enhanced through prohibition of cross-country motorized travel (eliminates exposure to asbestiform dust and mine sites). Some landslide risk remains due to 19 miles of routes in unstable land added to NFTS. Changes in NFTS through addition of mixed use will not affect public health.	Landslide risk would decrease due to prohibition of cross-country travel on 3,325 acres of unstable lands. Public safety would be enhanced through prohibition of cross-country motorized travel (eliminates exposure to asbestiform dust and mine sites).	Landslide risk would decrease due to prohibition of cross-country travel on 3,325 acres of unstable lands. Public safety would be enhanced through prohibition of cross-country motorized travel (eliminates exposure to asbestiform dust and mine sites). Changes in NFTS through addition of mixed use will not affect public health.	Landslide risk would decrease due to prohibition of cross-country travel on 3,325 acres of unstable lands. Public safety would be enhanced through prohibition of cross-country motorized travel (eliminates exposure to asbestiform dust and mine sites). Some landslide risk remains due to 16 miles of routes in unstable land added to NFTS. Changes in NFTS through addition of mixed use will not affect public health.	Landslide risk would decrease due to prohibition of cross-country travel on 3,325 acres of unstable lands. Public safety would be enhanced through prohibition of cross-country motorized travel (eliminates exposure to asbestiform dust and mine sites). 8 miles of routes in unstable land added to NFTS. Some landslide risk remains due to 16 miles of routes in unstable land added to NFTS. Changes in NFTS through addition of mixed use will not affect public health.	Landslide risk would decrease due to prohibition of cross-country travel on 3,325 acres of unstable lands. Public safety would be enhanced through prohibition of cross-country motorized travel (eliminates exposure to asbestiform dust and mine sites). 8 miles of routes in unstable land added to NFTS. Some landslide risk remains due to 16 miles of routes in unstable land added to NFTS. Changes in NFTS through addition of mixed use will not affect public health.
Soil Resources	497 miles of unauthorized routes will continue to be used; route proliferation could result in additional routes being created. At a minimum, soil productivity will be foregone on 874 acres of routes in the long term.	92 miles of routes and 65 acres of open riding area will be added to the NFTS; soil productivity will be foregone in the long term on 249 acres. As undesignated routes recover, soil productivity will return on 690 acres.	497 miles of unauthorized routes are allowed to recover; in the long term, soil productivity will return on 874 acres.	7 miles of routes will be added to the NFTS; soil productivity will be foregone in the long term on 14 acres. As undesignated routes recover, soil productivity will return on 860 acres.	69 miles of routes and 53 acres of open riding area will be added to the NFTS; soil productivity will be foregone in the long term on 191 acres. As undesignated routes recover, soil productivity will return on 736 acres.	59 miles of routes and 53 acres of open riding area will be added to the NFTS; soil productivity will be foregone in the long term on 171 acres. As undesignated routes recover, soil productivity will return on 756 acres.	74 miles of routes and 53 acres of open riding area will be added to the NFTS; soil productivity will be foregone in the long term on 211 acres. As undesignated routes recover, soil productivity will return on 716 acres.

Hydrology	Route proliferation from cross-country motorized travel can increase road densities, mileage of routes in riparian reserves. Traffic-generated sediment continues to be generated on 497 miles of routes. No negative effect on beneficial uses of water.	Prohibition on cross-country motorized travel reduces watershed effects; eliminates potential for new routes in riparian reserves. Road densities decrease substantially in all watersheds. Addition of routes to NFTS does not negatively affect beneficial uses.	Prohibition on cross-country motorized travel reduces watershed effects; eliminates potential for new routes in riparian reserves. Road densities decrease substantially in all watersheds. There are no negative effects on beneficial uses.	Prohibition on cross-country motorized travel reduces watershed effects; eliminates potential for new routes in riparian reserves. Road densities decrease substantially in all watersheds. Addition of routes to NFTS does not negatively affect beneficial uses.	Prohibition on cross-country motorized travel reduces watershed effects; eliminates potential for new routes in riparian reserves. Road densities decrease substantially in all watersheds. Addition of routes to NFTS does not negatively affect beneficial uses.	Prohibition on cross-country motorized travel reduces watershed effects; eliminates potential for new routes in riparian reserves. Road densities decrease substantially in all watersheds. Addition of routes to NFTS does not negatively affect beneficial uses.	Prohibition on cross-country motorized travel reduces watershed effects; eliminates potential for new routes in riparian reserves. Road densities decrease substantially in all watersheds. Addition of routes to NFTS does not negatively affect beneficial uses.
Fisheries	Cross-country motorized travel has the potential to negatively affect TES fish species through direct effects at 14 stream crossings, and degradation of habitat from new routes on 1.2 million acres.	Prohibition of cross-country motorized travel has beneficial effects on TES fish species by reducing direct and indirect disturbance. Eliminating 12 stream crossings has direct beneficial effects. Addition of routes to NFTS does not adversely affect TES fish.	Prohibition on cross-country motorized travel has beneficial effects on TES fish species through reduction of direct and indirect effects. Eliminating 14 stream crossings has beneficial direct effects.	Prohibition on cross-country motorized travel has beneficial effects on TES fish species through reduction of direct and indirect effects. Eliminating 13 stream crossings has beneficial direct effects. Addition of routes to NFTS does not adversely affect TES fish.	Prohibition on cross-country motorized travel has beneficial effects on TES fish species through reduction of direct and indirect effects. Eliminating 11 stream crossings has beneficial direct effects. Addition of routes to NFTS does not adversely affect TES fish.	Prohibition on cross-country motorized travel has beneficial effects on TES fish species through reduction of direct and indirect effects. Eliminating 11 stream crossings has beneficial direct effects. Addition of routes to NFTS does not adversely affect TES fish.	Prohibition on cross-country motorized travel has beneficial effects on TES fish species through reduction of direct and indirect effects. Eliminating 13 stream crossings has beneficial direct effects. Addition of routes to NFTS does not adversely affect TES fish.

Terrestrial Wildlife	Cross-country motorized travel has potential to negatively impact numerous wildlife species through both disturbance and removal or degradation of habitat from new routes on 1.2 million acres.	Prohibition on cross-country motorized travel has beneficial effects on numerous wildlife species and habitats through reduction in noise and elimination of potential for loss or degradation of habitat. Addition of routes to NFTS does not negatively affect wildlife species or habitats.	Prohibition on cross-country motorized travel has beneficial effects on numerous wildlife species and habitats through reduction in noise and elimination of potential for loss or degradation of habitat	Prohibition on cross-country motorized travel has beneficial effects on numerous wildlife species and habitats through reduction in noise and elimination of potential for loss or degradation of habitat Addition of routes to NFTS does not negatively affect wildlife species or habitats.	Prohibition on cross-country motorized travel has beneficial effects on numerous wildlife species and habitats through reduction in noise and elimination of potential for loss or degradation of habitat Addition of routes to NFTS does not negatively affect wildlife species or habitats.	Prohibition on cross-country motorized travel has beneficial effects on numerous wildlife species and habitats through reduction in noise and elimination of potential for loss or degradation of habitat Addition of routes to NFTS does not negatively affect wildlife species or habitats.	Prohibition on cross-country motorized travel has beneficial effects on numerous wildlife species and habitats through reduction in noise and elimination of potential for loss or degradation of habitat Addition of routes to NFTS does not negatively affect wildlife species or habitats.
Botanical Resources	Cross-country motorized travel has potential to negatively affect TES species of plants and their habitats on 1.2 million acres.	Prohibition of cross-country motorized travel provides substantial benefits to TES plants and their habitats. None of the routes to be added to the NFTS affect TES plants.	Prohibition of cross-country motorized travel provides substantial benefits to TES plants and their habitats.	Prohibition of cross-country motorized travel provides substantial benefits to TES plants and their habitats. None of the routes to be added to the NFTS affect TES plants.	Prohibition of cross-country motorized travel provides substantial benefits to TES plants and their habitats. None of the routes to be added to the NFTS affect TES plants.	Prohibition of cross-country motorized travel provides substantial benefits to TES plants and their habitats. None of the routes to be added to the NFTS affect TES plants.	Prohibition of cross-country motorized travel provides substantial benefits to TES plants and their habitats. None of the routes to be added to the NFTS affect TES plants.

Non-native Invasive Species	Cross-country motorized travel and route proliferation have potential to generate new disturbed sites and vectors for establishment and spread of non-native plant species on 1.2 million acres. 16 high risk weed sites have been identified on existing unauthorized routes.	Prohibition of cross-country motorized travel reduces soil disturbance that can create sites for establishment of non-native species, and eliminates potential for creation of new vectors through route proliferation. Routes proposed for addition to NFTS are associated with 12 high risk weed sites.	Prohibition of cross-country motorized travel reduces soil disturbance that can create sites for establishment of non-native species, and eliminates potential for creation of new vectors through route proliferation.	Prohibition of cross-country motorized travel reduces soil disturbance that can create sites for establishment of non-native species, and eliminates potential for creation of new vectors through route proliferation. Routes proposed for addition to NFTS are associated with 12 high risk weed sites.	Prohibition of cross-country motorized travel reduces soil disturbance that can create sites for establishment of non-native species, and eliminates potential for creation of new vectors through route proliferation. Routes proposed for addition to NFTS are associated with 12 high risk weed sites.	Prohibition of cross-country motorized travel reduces soil disturbance that can create sites for establishment of non-native species, and eliminates potential for creation of new vectors through route proliferation. Routes proposed for addition to NFTS are associated with 12 high risk weed sites.	Prohibition of cross-country motorized travel reduces soil disturbance that can create sites for establishment of non-native species, and eliminates potential for creation of new vectors through route proliferation. Routes proposed for addition to NFTS are associated with 12 high risk weed sites.

Alternatives Considered But Eliminated from Detailed Analysis

Federal agencies are required by NEPA to rigorously explore and objectively evaluate reasonable alternatives and to briefly discuss the reasons for eliminating any alternatives that were not developed in detail (40 CFR 15.02.14). The following alternatives were submitted in response to the Notice of Intent and Proposed Action published in August 2008.

Alternative A: Add all unauthorized routes to NFTS or permit cross-country travel, and maximize motorized opportunities on the existing NFTS

This alternative was developed in response to comments received during scoping (and from the public at open houses held in Siskiyou County prior to the NOI) from people who would like to add all unauthorized routes to the NFTS and/or permit cross-country travel. This alternative would add all of the unauthorized routes that were inventoried, and have no seasonal closures. All ML 3 roads would be designated for mixed use.

This alternative does not meet the purpose and need. Many of the inventoried unauthorized routes have resource conflicts and create a potential for resource damage if added to the NFTS and opened to public use. Adding all of the unauthorized routes would not meet the criteria of minimizing damage to soil, vegetation and other Forest resources. Many routes would require extensive, expensive work to bring them up to standard. Similarly, many ML 3 roads are unsuitable for mixed use due to safety reasons related to design, speed, or level of use. Leaving the Forest open to unrestricted cross-country use would not meet the needs of regulating public motor vehicle travel and conforming to the Travel Management Rule.

Alternative B: Allow motorized use of existing NFS non-motorized trails.

This alternative was developed in response to comments received during scoping from people who would like motorized use of existing NFS non-motorized trails, such as Trail Creek to Siphon Lake, Six Mile Trail, and Deacon Lee Trail.

This alternative does not meet the purpose and need. Adding motorized use to equestrian and foot trails would create conflicts between motor vehicles and existing recreational uses of NFS land, and create safety issues associated with those conflicts. In addition, the non-motorized trails were not intended for motorized use, and would require engineering review, design, and potentially significant reconstruction to accommodate that use.

Alternative C: Allow dispersed camping access along roads through the designation of buffers or corridors where cross-country travel would be permitted.

This alternative was developed in response to comments received during scoping from people who would like motorized access to camp away from the road, but not necessarily in a well-established site.

This alternative does not meet the purpose and need. Because the Forest has an extensive road system, buffers would add a huge area where motorized use and potential resource damage can occur, which is inconsistent with the need to regulate motorized use. A slightly more restrictive alternative would allow motorized vehicle use within 300 feet of any designated route for camping, parking, or other recreation site use. Due to the high density of routes on many parts of the KNF, this alternative would have impacts similar to those of the no action alternative.

Alternative D: Designate staging areas in addition to proposed routes and NFTS changes.

This alternative was developed in response to comments received during scoping from people who would like staging areas designated in addition to proposed routes and NFTS changes.

Designation of staging areas is outside the scope of this project. OHV users may stage from existing designated roads if they are within about 30 feet of the road. Separate staging areas would require construction, signing, and possibly other improvements. If needed in the future, such areas will be analyzed and authorized under separate analysis processes.

Alternative E: Allow cross-country motorized use off designated routes in order to retrieve legally taken big game animals.

This alternative was developed in response to comments received during scoping from people who would like to use motorized vehicles off designated routes to retrieve downed big game.

Allowing motorized off-road travel to any site where an animal is taken means that all lands on the Forest would be open to off-road vehicle use (for a specific purpose) during hunting season. While the period of use would be limited (about 8 weeks for rifle and archery seasons), the resulting impacts are considered to be similar to, but less intense than, those that would occur under the no action alternative. A slightly more restrictive alternative would allow hunters to drive up to 300 feet from any designated route to retrieve a big game animal. Due to the high road density on many parts of the KNF, this alternative would have impacts similar to one which allows unrestricted travel for this purpose.

Alternative F: Add more routes and mixed use.

This alternative was submitted by a local off-road riding group and local riders. This alternative would add more unauthorized routes and more mixed use than any action alternative. It would allow motorized use of two non-motorized NFS trails. It would add 1.4 miles of routes, some of which were not on the original unauthorized route inventory, to the west of the Juniper Flat open riding area on the Goosenest Ranger District.

This alternative does not meet the purpose and need for the project. Many of the unauthorized routes proposed in this alternative would not meet the criteria of minimizing damage to soil, vegetation, or other Forest resources; and conflicts between motor vehicles and existing

recreational uses of NFS lands. In addition, the non-motorized trails were not intended for motorized use, and would require engineering review, design, and potentially significant reconstruction to accommodate that use. Many roads proposed for mixed use in this alterntiave are unsuitable for simultaneous use by highway and non-highway-legal vehicles due to safety reasons related to design, speed, or level of use.

The area to the north and west of the Juniper Flat open riding area was completely surveyed for cultural resources in 2007. Review of the suggested routes indicates that vehicle use is currently affecting several identified cultural sites. In January of 2009, representatives from the Klamath Tribes visited the area with district personnel. Tribal representatives requested that this area be closed to off-road travel in order to eliminate further impacts to identified cultural resource sites. The suggested routes do not meet the criterion of minimizing damage to Forest resources and will not be evaluated further.

Alternative G: Add fewer routes and decommission or close existing NFTS roads.

This alternative was submitted by environmental interest organizations. This alternative would decommission or close numerous NFTS roads and remove numerous unauthorized routes from the proposed action based on concerns for fisheries, wildlife, and citizen inventoried roadless areas.

This alternative is outside the scope of the project. The project's purpose and need focuses on Subpart B of the Travel Management Rule, which does not address decommissioning of NFTS roads. Alternative 3 adds no unauthorized routes, and Alternative 4, which was developed in response to public concerns regarding effects to fisheries, wildlife and roadless areas, adds fewer unauthorized routes than the proposed action.

Chapter 3 - Affected Environment and Environmental Consequences

Introduction

This analysis considers the entire Klamath National Forest (KNF), located primarily in Siskiyou County in northern California with a portion (approximately 29,000 acres) in Jackson County, Oregon. The 18,400 acre Butte Valley National Grassland (BVNG) is managed by the KNF, and is located near the east side of the Forest. Any changes in travel management on the KNF would also apply to the BVNG.

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

The affected environment section under each resource topic describes the existing, or baseline, condition against which environmental effects were evaluated, and from which progress toward the desired condition can be measured. The environmental consequences section forms the scientific and analytical basis for comparison of the alternatives, including the proposed action. This section discusses direct, indirect, and cumulative effects, along with applicable mitigation measures. These terms are defined as follows:

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

Analysis Process

The environmental consequences presented here address the impacts of the actions proposed under each alternative for the KNF. This effects analysis was done at the site-specific and forest scales (the scale of the proposed action as discussed in Chapter 1). Each route and area proposed in the alternatives has been reviewed by resource specialists. These findings are summarized in Appendix A. Readers seeking information concerning the environmental effects associated with a specific road, trail, or area are directed to this appendix, where mitigation measures or other findings are documented. A more detailed display is available in the project planning records in the KNF Supervisor's Office in Yreka, CA.

For ease of documentation and understanding, the effects of the alternatives are described separately for three discrete actions and then combined to provide the total direct and indirect effects of each alternative (see below). The combination of the effects of these discrete actions is then added to effects of the past, present, and reasonably foreseeable actions in the cumulative effects analysis. The three discrete actions common to all action alternatives are:

1) **Prohibition of cross-country motor vehicle travel.** The direct and indirect effects of this action are described generally in each alternative, considering both current conditions and projected trends. Both short (1 year) and long-term (approximately 20 years) effects are presented.

2) **Addition of new facilities (roads, trails, and/or areas) to the National Forest Transportation System (NFTS).** As described above, the impacts of new facilities are addressed in sum total in this chapter, while impacts of individual routes or areas are addressed in Appendix A. For most resources, one or more resource indicators are used to measure the direct and indirect effects of each alternative. Both short (1 year) and long-term (approximately 20 years) impacts are presented.

3) **Changes to vehicle class on the existing NFTS.** Impacts caused by changes to vehicle class on the existing NFTS are described generally by alternative. For some impacts (for example public safety), impacts are also addressed by route.

Cumulative Effects

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

The cumulative effects analysis area is described under each resource, but in most cases includes the entire KNF including private and other public lands that lie within the Forest boundary.

In order 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. Existing conditions are considered to reflect the aggregate impact of all prior human actions and natural events that have affected the environment and might contribute to cumulative effects. This cumulative effects analysis does not attempt to quantify the effects of past human actions by adding up all prior actions on an action-by-action basis. There are several reasons for not taking this approach. First, a catalog and analysis of all past actions would be impractical and unduly costly to compile. Current conditions have been impacted by innumerable actions over the last century (and beyond), and trying to isolate the individual

actions that continue to have residual impacts would be nearly impossible. Second, providing the details of past actions on an individual basis would not be useful to predict the cumulative effects of the proposed action or alternatives. In fact, focusing on individual actions would be less accurate than looking at existing conditions, because there is limited information on the environmental impacts of individual past actions, and one cannot reasonably identify each and every action over the last century that has contributed to current conditions. Additionally, focusing on the impacts of past human action ignores the important residual effects of past natural events which may contribute to cumulative effects just as much as human actions. By looking at current conditions, we are sure to capture all the residual effects of past human actions and natural events, regardless of which particular action or event contributed those effects. Third, public scoping for this project did not identify any public interest or need for detailed information on individual past actions. Finally, the Council on Environmental Quality issued an interpretive memorandum on June 24, 2005, regarding analysis of past actions, which states, "agencies can conduct an adequate cumulative effects analysis by focusing on the current aggregate effects of past actions without delving into the historical details of individual past actions." Past actions are treated similarly in the recently published Forest Service Regulations for implementing the National Environmental Policy Act (36 CFR 220). For these reasons, the analysis of past actions in this section is based on current environmental conditions.

Appendix B lists present and reasonably foreseeable future actions potentially contributing to cumulative effects. While the appendix lists all actions, every resource is not affected by every action. For example, a future project may affect wildlife but not affect water quality.

Affected Environment Overview

There are many aspects of the affected environment shared by all resources. In order to avoid repeating these shared elements of the affected environment in each resource section, the following general elements of the affected environment are provided.

The Klamath National Forest consists of approximately 1.7 million acres in north central California and south central Oregon. On some of the 1.2 million acres of Klamath National Forest System (NFS) lands that have long been managed as open to cross-country motor vehicle travel, repeated use has resulted in unplanned, unauthorized routes. These routes developed without environmental analysis or public involvement, and do not have the same status as NFTS roads and NFTS trails included in the forest transportation system.

The KNF is divided into the east side and west side by Interstate 5. The east side of the KNF, approximately 20% of the landbase, consists of the Goosenest Ranger District and the Butte Valley National Grassland. This land of relatively gentle terrain was added to the KNF after its establishment as a National Forest; the Butte Valley National Grassland (BVNG) was designated in 1991; before that it was managed by the KNF as a land use project. The BVNG includes routes

that have been maintained by permittees and utility companies; these routes have been used by motorized vehicles for years, especially by bird watchers, but were never made part of the NFTS.

The west side of the KNF, approximately 80% of the land, varies from relatively gentle to moderately steep terrain west of Interstate 5 to very steep mountains further west. The relatively gentle Humbug drainage, just west of the town of Yreka and Interstate 5, was the site of mining in the past. Roads were built by mining companies without use of the design standards required of NFTS roads. Since the decline of the mines, the resulting unauthorized routes have been used by OHV vehicles.

Assumptions Applicable to all Resources

- No NEPA decision is necessary to continue use of the NFTS (i.e., OHV and transportation) as currently designated and managed under the no action alternative. The decisions to construct these roads were made previous to this project.
- Unauthorized or user-created roads, trails, and areas are not NFTS facilities. They are unauthorized. The agency never took action to create, manage, or construct them for public use. Most were created by the public as a result of cross-country travel.
- Temporary roads, trails, and areas built to support emergency operations or temporarily authorized in association with contracts, permits, or leases are not intended for public use. They are not NFTS facilities (e.g., they are not authorized for public use). Any proposal to add temporary roads to the NFTS will require a separate NEPA decision.
- Any unauthorized routes not included in the proposed action are not precluded from consideration for addition to the NFTS in future travel management actions.
- The Forest Service will continue to make changes to the NFTS on an as-needed basis. It will also continue to make decisions about temporary roads or trails on an as-needed basis associated with contract, permit, lease, or other written authorization.
- Any activity associated with contract, permit, lease, or other written authorization is exempt from designation under the Travel Management Rule (36 CFR 212.51 (a) (8)) and should not be part of the proposal (i.e., fuel-wood permits, motorized special use permits, etc.). Such actions are subject to separate NEPA analysis.
- Designation is an administrative act which does not trigger NEPA. Designation technically occurs with printing of the motor vehicle use map (MVUM). NEPA is not required for printing a map.
- For travel management, the Federal action triggering NEPA would be any changes to public access from those currently allowed or prohibited (i.e., prohibition of cross-country travel,

changing vehicle class, or closures) and any additions of facilities (roads, trails, or areas) to the NFTS.

- Previous decisions on the NFTS do not need to be revisited to implement an MVUM or the Travel Management Rule. That is, the NFTS consists of existing facilities that either underwent NEPA or predate NEPA. Continued motorized use of the system, in accordance with existing laws and regulations, does not require NEPA. Since designation is not a Federal action subject to NEPA (see #7), no NEPA is needed to designate an existing NFTS facility (road, trail, or area) when no changes to current use or management of that facility are proposed.
- Dispersed camping, as well as any dispersed recreation activity, is not part of the scope of the proposed action. These activities are not connected actions to travel management decisions because they can be undertaken independently of motorized travel (camping, hunting, fishing, hiking, etc.).
- Assigning maintenance levels and changes to maintenance levels of roads or trails (where vehicle use would be unchanged) is an administrative action and not subject to NEPA. However, changes in allowed vehicle class, access, and proposals to construct or reconstruct facilities are subject to NEPA.
- Law enforcement capability and compliance is being analyzed with the assumption that the majority of the public are compliant with laws and regulations (based on field observations) and that compliance will increase with implementation of an MVUM.
- The newly-designated routes will be signed, and all additions or changes to the NFTS will meet standards prior to availability for public use.
- The NFTS will continue to be maintained according to the strategies outlined in the Public Uses (Roads) white paper in Appendix C.

Resource Reports

Each section in this chapter provides a summary of the project-specific reports, assessments, and input prepared by Forest Service specialists, which are incorporated by reference in this Final Environmental Impact Statement (FEIS). Each of the following sections includes a summary of the report findings, including a description of the methodology used to determine impacts. The following reports and memoranda are incorporated by reference: botanical biological assessment and biological evaluation (BA and BE); BA and BE for fish; BA and BE for terrestrial wildlife; socioeconomic report; and the heritage resources report. These reports or memoranda are part of the project record on file at the Forest Supervisor's Office in Yreka, California. Copies of most of these reports are available upon request by contacting Jan Ford, Project Leader, at 1312 Fairlane

Road, Yreka, CA, 96097, or (530)842-6131. The heritage resource report contains confidential information and portions of the report are not available to the public.

Route-specific Data

During the planning stages of the travel management project for the Klamath National Forest, members of the public recommended changes to the existing NFTS with a focus on unauthorized routes. Comments regarding specific routes were also received during the public scoping period for the notice of intent (NOI). The Forest developed route cards (summarized in Appendix A and contained in the project record) for all routes considered in Alternatives 2, 4, 5, 6, and 7. For these routes, each route card identifies the alternative(s) under which the route is proposed, the type of vehicles allowed, the season when the route would be open, and any additional work or mitigation measures that would be implemented on the route prior to allowing public use. The information on the route cards is summarized in Appendix A.

Law Enforcement Assumptions Common to Effects Analyses

- The laws and regulations related to travel management will be enforced equally in authority and weight as with all other Federal laws and regulations.
- As with any change in a regulation on NFS lands, there is usually a transitional period for the public to understand the changes. It is anticipated there will be a higher number of violations to the Travel Management Rule the first few years and the number of violations will decline as the users understand and comply with the rules.
- Once the MVUM is published, the implementation of the established dedicated network of roads, trails, and areas with signs and user education programs, will reduce the number of motor vehicles traveling off of designated routes.
- Providing motorized recreation opportunities in popular, key areas will help relieve pressure to travel off of designated routes.
- The KNF will give special emphasis to the areas in which most OHV use is likely to occur, prioritize and quickly deal with the 1% to 5% of users who create problems, and do so with current KNF funds and personnel (with possible additional funds from the State of California OHV grant program).
- For more information about law enforcement, see Appendix D.

Analysis Framework: Statute, Regulation, LRMP and Other Direction

The National Environmental Policy Act (NEPA) at 40 CFR 1502.25(a) directs "to the fullest extent possible, agencies shall prepare draft environmental impact statements concurrently with and integrated with …other environmental review laws and executive orders." Each resource section includes a list of applicable laws, regulations, policies and Executive Orders that are relevant to that resource. Surveys, analyses, and findings required by those laws are addressed in those sections.

National Forest Management Act: The Forest Service is complying with the provisions of this law (see Chapter 2 for how the Forest complies with the NFMA in its monitoring activities).

Travel Management Rule (36 CFR 212): The Forest Service is complying with the provisions of this law (see the project file for a copy of the rule).

Wilderness Act of 1964: The actions proposed are in compliance with wilderness designations and the Wilderness Act of 1964. Motorized activity continues to be prohibited in wilderness under all the alternatives per the Wilderness Act of 1964.

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Recreation

Introduction

Nearly all visitors to the Klamath National Forest, regardless of the purpose for their visit, use the motorized transportation system to reach their destination. Making changes to the NFTS (e.g. adding facilities, prohibiting or allowing motor vehicle use by vehicle type) changes the diversity of motorized and non-motorized opportunities available on the KNF. Visitors may be participating in motorized recreation, or using motor vehicles to access trailheads, facilities, destinations, or geographic areas that are used for non-motorized recreational activities. This section of the Motorized Travel Management FEIS examines the extent to which the diversity of recreation opportunities are affected by the proposed action and alternatives, and the extent to which alternatives are consistent with direction established in the Klamath National Forest Land and Resource Management Plan (LRMP), and the Travel Management Rule.

Analysis Framework: Statute, Regulation, LRMP, and Other Direction

Regulatory direction relevant and specific to the motorized travel management project as it affects recreation resources includes:

The **National Forest Management Act (NFMA)** sets forth requirements for development of Forest Plans. Implementing regulations set direction for developing standards and guidelines for management of recreation including use of off-highway vehicles.

Title 36 of the Code of Federal Regulations (36 CFR)Title 36, Code of Federal Regulations Part 212 is the implementing regulation for the Travel Management Rule. **36 CFR 212.55 (a)** requires the responsible official to consider the effects of designated roads, trails and areas on the provision of recreational opportunities, access needs, and conflicts among uses of National Forest System lands. **36 CFR 212.55 (b)** requires the responsible official to consider (and minimize where possible) conflicts between motor vehicle use and existing or proposed recreational uses of National Forest System lands or neighboring federal lands; conflicts among different classes of motor vehicle uses of National Forest System lands or neighboring federal lands; and the compatibility of motor vehicle uses with existing conditions in populated areas.

The Klamath National Forest LRMP provides goals for the recreation resource and requires a broad range of developed and dispersed recreation opportunities in balance with existing and future demand. For management and conceptual convenience possible mixes or combinations of activities, settings, and probable experience opportunities have been arranged along a spectrum, or continuum. This continuum is called the recreation opportunity spectrum (ROS), and planning for recreation opportunities using the ROS is conducted as part of land and resource management planning. The ROS provides a framework for defining the types of outdoor

recreation the public might desire, and identifies that portion of the spectrum a given National Forest might be able to provide. The ROS is divided into six classes: primitive, semi-primitive non-motorized, semi-primitive motorized, roaded natural, rural and urban. Each class is defined in terms of its combination of activity, setting, and experience opportunities (ROS Users Guide USDA Forest Service, 1982). The ROS is incorporated into LRMP management prescriptions, and may be used in project level planning.

The following forest-wide standards and guidelines are relevant to travel management:

12-1 Manage Forest resources to provide a broad range of recreational opportunities that meet changing recreational demands. Actively utilize the Forest's meaningful measures methodology for establishing recreation program standards, monitoring, and reporting accomplishments. Identify, develop, and conserve recreational opportunities within developed and dispersed settings. Eliminate or restrictively manage sites that receive minimal use; or, remove the facilities and manage them as dispersed spots. Develop a range of recreation opportunities within primitive, semi-primitive non-motorized, semi-primitive motorized, and roaded natural areas. As opportunities are identified for these areas, they should be managed to reflect the needs of a multi-cultural public. Provide a variety of sites to meet visitor preferences, needs and expectations to complement opportunities within the recreation emphasis area in which the site is located.

12-11 Restrict off-highway vehicle (OHV) use to protect key resource values and meet management objectives.

12-15 Develop trail management objectives for all trails on the Forest. All trails in the Forest system should be inspected regularly to identify trail maintenance needs.

12-26 ROS classes identified for management areas emphasize general direction for recreation management. Specific ROS criteria and conditions are subject to adjustment in order to achieve desired conditions.

In addition to the above forest-wide standards and guidelines, each management area is assigned a ROS class or a range of ROS classes to guide decisions and resource management activities. The Forest ROS map displays the ROS class assigned to Forest lands in the LRMP. The Forest ROS map was used to determine if proposed route additions would meet the ROS class allocated to the management area. See the LRMP for standards and guidelines specific to each management area (USDA Forest Service, 1995).

Effects Analysis Methodology

Assumptions Specific to the Recreation Analysis

- The prohibition of cross-country travel is not a change to the ROS designation; it is simply a prohibition within that ROS 'zone' to travel off designated routes.
- The change from an open to cross-country travel condition to a cross-country travel prohibited condition will reduce the availability of acreage for both motorized recreation and motorized access to dispersed recreation activities.
- The change from an open to cross-country travel condition to a cross-country travel prohibited condition will increase the availability of acreage on which only non-motorized recreation and non-motorized access to dispersed recreation activities will occur.
- Proposed additions to the NFTS will provide a variety of trail riding experiences and increase the number of motorized recreation opportunities (loops, connectors), which will have a beneficial effect on motorized recreation opportunities.
- The Forest's National Visitor Use Monitoring (NVUM) report accurately expresses the most popular motorized and non-motorized recreation activities for use in this analysis.
- The area of influence (dust, noise) of motorized use on 'quiet recreation' opportunities is ½ mile.
- There has never been any use analysis or traffic counts on the unauthorized routes; therefore, it would be highly speculative to make assumptions of use levels on these routes.
- The majority of the motorized public use occurring on the KNF is occurring on NFTS roads (based on observation).
- Adding more routes to the NFTS is not likely to generate additional motorized use across the Forest because (1) most current motorized use is on NFTS roads, not on unauthorized routes; (2) use will continue to be dispersed across the Forest; (3) most use is by local residents; (4) the population of Siskiyou County has remained static for 20 years; and (5) we do not have any data that indicate such an increase would occur (see Society, Culture and Economy section of this chapter for additional information).

Data Sources

- KNF LRMP for distribution of ROS classes
- The GIS data layers for ROS and wilderness boundaries

- The Forest's NVUM report for most popular non-motorized and motorized recreation activities
- Recreation, law enforcement, and other resource staff observations

Indicators

Consistency of project with ROS classes identified in the LRMP

- Impact of proposed additions to the NFTS on non-motorized recreation: (1) number of miles of unauthorized routes added to NFTS; (2) acres within ½ mile of added unauthorized routes (areas outside of this buffer would be considered available for quiet recreation and non-motorized activities without the potential for use conflicts with motorized vehicles)
- Motorized recreation opportunity on roads or open riding areas proposed for addition to the NFTS: miles of unauthorized routes added to the NFTS as roads, and number and acres of open riding areas added to the NFTS, by vehicle class and season of use
- Motorized recreation opportunity added to or subtracted from current NFTS roads: (1) miles of existing NFTS roads available for non-highway legal vehicles (miles of motorized recreation opportunity added by allowing mixed use on NFTS maintenance level 3 roads or moving NFTS roads from maintenance level 3 to maintenance level 2); and (2) miles of existing NFTS roads available for highway legal vehicles only (subtracted from current mixed use)
- Motorized recreation opportunity on trails proposed for addition to the NFTS: miles of unauthorized routes added to the NFTS as trails by vehicle class, degree of difficulty and season of use
- Motorized access to dispersed recreation opportunities: number of unauthorized routes to dispersed recreation sites available for motorized use (in Alternative 1) or added to the NFTS (in action alternatives)
- Effects on wilderness resources: miles of routes within ½ mile of wilderness boundaries available for motorized use (in Alternative 1) or added to the NFTS (in action alternatives)
- All indicators were used for all actions, except that cumulative effects analysis for alternatives did not consider (1) Recreation Opportunity Spectrum (because all routes proposed for addition to the NFTS in ongoing and reasonably foreseeable future actions listed in Appendix B comply with the ROS class in their associated management area) or (2) proximity to wilderness areas (because none of the ongoing or reasonably foreseeable future actions are within ½ mile of wilderness boundaries). Cumulative effects on ROS and

wilderness are, therefore, identical to those described for direct and indirect effects for each alternative.

Methodology by Action

1. Direct and indirect effects of the prohibition of cross-country motorized vehicle travel

Short-term timeframe: 1 year.

Long-term timeframe: 20 years.

Spatial boundary: Forest

Methodology: GIS analysis.

Attempting to quantify where cross-country motorized travel would occur under Alternative 1 is speculative since it is impossible to predict exactly where, when, or how cross-country motorized use would occur. For consistency in comparing alternatives, the inventoried unauthorized OHV routes were used to determine the area potentially affected by cross-country motorized use and provide a minimum baseline for disturbance.

1. Direct and indirect effects of adding facilities to the NFTS

Short-term timeframe: 1 year.

Long-term timeframe: 20 years.

Spatial boundary: Forest

Methodology: GIS analysis.

3. Direct and indirect effects of changes to the existing NFTS

Short-term timeframe: 1 year.

Long-term timeframe: 20 years.

Spatial boundary: Forest

Methodology: GIS analysis.

4. Cumulative Effects

Short-term timeframe: Not applicable; cumulative effects analysis will be done only for the long-term time frame.

Long-term timeframe: 20 years.

Spatial boundary: Forest. This analysis area was selected because impacts to the recreation system in one area of the Forest can affect the continuity of the system and public access opportunities in other parts of the Forest.

Methodology: GIS analysis.

Cumulative effects are the additive effects of this project and of ongoing and reasonably foreseeable future actions (listed in Appendix B). Past actions are considered part of the existing condition and are discussed in the Affected Environment. Ongoing and reasonably foreseeable future actions that may produce short-term effects to quiet, non-motorized recreation and to motorized recreation include vegetation management projects (timber harvest, fuel reduction) and road-related projects (construction, reconstruction, and removal from the NFTS through decommissioning or conversion to non-motorized trails). Although some of the vegetation management actions may overlap unauthorized routes in space, these actions have short-lived impacts on quiet recreation or motorized recreation use through noise and potential interference with recreation use of an area for a limited amount of time. Road-related actions are likely to have the same types of effects on quiet and motorized recreation as the actions proposed in this motorized travel management project. Because only long term effects are considered in the cumulative effects analysis, this document focuses on road-related projects that have the potential to affect quiet recreation and motorized recreation in the long term.

Affected Environment

The Klamath National Forest's 1.7 million acre expanse of winding river canyons, rugged wilderness areas, and distinctive volcanic landscapes provide a setting for a variety of recreational activities. Remoteness from large population centers provides opportunities for uncrowded recreational experiences. The Klamath's rich traditional and contemporary cultures of Native Americans, western settlers, ranchers, loggers and miners further enrich the experiences of today's visitors.

The National Visitor Use Monitoring (NVUM) program provides information about recreation use of National Forest System Lands at the national, regional, and forest levels. NVUM data is science-based, reliable information about the type, quantity, quality, and location of recreation use on public lands. The Klamath National Forest has hosted NVUM monitoring in 2001 and 2008. In 2008, the KNF was subjected to over 120 days of wildfire, beginning early in June. Numerous trails and wilderness areas were closed by Forest Order for public safety during the summer. Smoke was dense in many popular recreation areas, and many daily survey records show zero recreation use. This situation resulted in use numbers that are unusually low (visitor numbers were down by over 35%) and which may be skewed towards certain types of activities.

Forest recreation specialists feel that these results do not accurately reflect the type and amount of recreation that would typically be expected on the KNF. Therefore, NVUM data from 2001 are used here. NVUM methodology and analysis is explained in detail at (http://www.fs.fed.us/recreation/programs/nvum).

Table R-1. Klamath NF visitor activity participation and primary activity as reported in NVUM results (2001).

Activity	Percent Participating	Percent as Main Activity
Viewing Natural Features	61.4	15.3
Relaxing	38.0	9.7
Hiking / Walking	20.3	3.3
Downhill Skiing	1.4	1.0
Viewing Wildlife	43.9	1.0
Horseback Riding	0.4	0.3
Driving for Pleasure	26.6	8.1
Other Non-motorized	6.9	2.2
Other Motorized	0.0	0.0
Fishing	7.1	3.7
Developed Camping	4.1	2.1
OHV Use	8.5	1.1
Primitive Camping	4.0	1.1
Nature Study	14.4	0.9
Hunting	3.1	2.9
Gathering Forest Products	8.4	6.8
Nature Center Activities	2.0	0.3
Non-motorized Water	2.1	1.2
Motorized Water Activities	0.3	0.0
Picnicking	8.3	3.9
Cross-country Skiing	18.5	18.3
Snowmobiling	0.6	0.6
Bicycling	0.8	0.3
Visiting Historic Sites	1.1	0.0
Backpacking	3.9	2.2
Resort Use	0.3	0.0

Based on the NVUM, there were 535,577 visits to National Forest System Lands on the Klamath NF during fiscal year 2001, with the most popular recreational activities being relaxing, viewing natural features, driving for pleasure, hiking, cross-country skiing, and viewing wildlife. Other popular activities include fishing, hunting, whitewater pursuits, swimming, camping, bicycling, snowmobiling, gathering forest products and other automobile travel. Most visitors come from nearby communities with more than 50 percent from Siskiyou County, CA, or Jackson County, OR (USDA Forest Service, 2001).

It is estimated that 142,463 visits involved some time spent driving for pleasure, 45,524 visits involved off-highway vehicles, and for 5,891 visits the primary activity was off-highway vehicle use. Approximately 49,273 visits included some kind of motorized activity. About 64,269 visits included non-motorized activities (Table R-2).

Table R-2. Klamath NF visits by type of main activity

Type of Use	NVUM Categories	Percent as Main Activity	Approximate Visitors in 2001
Camping	Developed Camping Primitive Camping	3.2	17,138
Hunting	Hunting	2.9	15,532
Motorized Uses	OHV use Driving for Pleasure Other Motorized Activity	9.2	49,273
Non-motorized Uses	Backpacking Fishing Hiking/Walking Horseback Riding Bicycling Other Non-Motorized Activities	12.0	64,269
Other Activities	Resort Use Picnicking Viewing Natural Features Visiting Historic Sites Nature Center Activities Nature Study Relaxing Gathering Forest Products Viewing Wildlife	37.9	202,984
Water Sports	Motorized Water Activities; Non-motorized Water	1.2	6,427
Winter Sports	Downhill Skiing; Cross-country Skiing; Snowmobiling	19.9	106,580

Of the 1.7 million acres on Klamath NF, about 455,000 acres, or 38 percent of the Forest, is closed to off-road vehicle travel by law or by LRMP management area standards and guidelines. Management areas closed to cross-country vehicle travel include wilderness areas, research natural areas, designated and recommended wild rivers, and backcountry. Available land outside of the management areas listed above results in about 1.2 million acres of land open for cross-country motorized travel. Topography and slope limit the use of vehicles so most of the use off NFTS roads is on the flatter terrain on the east side of the Forest. However, use of off-highway vehicles (ATVs, motorcycles, and dual-sport vehicles) is higher on the steeper west side of the Forest, where they are used extensively on the NFTS. This is due to proximity to several communities, the existence of an organized off-road riders club in Yreka, and the diversity of road conditions relatively close to town. There are two areas of concentrated OHV use: the Humbug drainage (about 5 miles from the town of Yreka), and the Juniper Flat area along Highway A-12 (about 20 miles east of Yreka and 15 miles north of the town of Weed). There are currently no designated trails for motorized vehicles on the KNF with the exception of snowmobile trails on the east side of the Forest.

A second type of off-road use occurs primarily with trucks and other large 4-wheel drive vehicles. These users generally do not drive cross-country for pleasure, but in support of other

activities such as dispersed recreation, woodcutting, and big game retrieval. These activities generally occur fairly close to designated roads. Overall, OHV use of the Forest is considered to be light.

Dispersed recreation is defined as outdoor recreation occurring over broad expanses of land or water and accounts for the majority of recreation use on the Klamath NF. This use occurs primarily during the fall and summer months. Approximately 322 dispersed recreation sites (camping sites and river access points) have been identified on the Forest. Many of these sites are located adjacent to NFTS roads, while others are accessed by short unauthorized routes. Dispersed recreation opportunities, especially dispersed camping opportunities, are highly valued by Forest visitors. Some dispersed sites have been used by the same families for several generations. Additionally, some dispersed recreation sites have a uniquely identifiable sense of place with vistas and scenery viewing opportunities. The identified river access points have been in use for many years, and are safe and reliable locations for launching or removing watercraft from the river. In some cases structures and facilities have been provided, primarily to protect resources rather than to provide user convenience.

Wild and Scenic Rivers

All or part of the Klamath, Scott and Salmon Rivers are designated as Wild and Scenic Rivers. Recreation use associated with the Klamath River is a large portion of the total dispersed use on the Forest. Wild and Scenic rivers on the west side of the Forest are a recreational attraction providing opportunities along approximately 200 miles of river. The Klamath, Scott and Salmon Rivers, as well as several of their larger tributaries, provide outstanding whitewater boating opportunities. Motorized access to these rivers is important for launching or removing watercraft efficiently. Corridors along designated or recommended Wild Rivers are closed to cross-country travel by the KNF LRMP, and most of these segments are also protected by wilderness designation. Designated and recommended Scenic and Recreational rivers allow a moderate level of motorized use (commensurate with protecting the outstandingly remarkable values for which the river is designated or recommended for designation). Motorized access to these segments of the rivers is important to a number of recreation visitors.

Wilderness

More than 380,000 acres, about 23 percent of the Forest's land base, is in wilderness. This includes all of the Marble Mountain Wilderness and Russian Wilderness, nearly half of the Siskiyou Wilderness, part of the Trinity Alps Wilderness, and a small portion of the Red Buttes Wilderness. The 2001 National Visitor Use Monitoring results estimate wilderness use to be approximately 24,000 visits per year. NFTS roads provide access to wilderness trailheads and some motorized intrusion into wilderness has occurred from these locations, although it is not a common occurrence. There is higher potential for motorists to intrude into the wilderness where

wilderness boundaries are not clearly marked. A few unauthorized routes are close to wilderness boundaries; these are primarily associated with established dispersed recreation sites.

Trails

The Forest trail system of 1,100 miles provides access for non-motorized recreational activities only. More than 60 percent of these trails are in wilderness areas and designated for non-motorized use. Prior to development of alternatives for this project, the Forest Supervisor decided that none of the non-motorized trails would be considered for designation as motorized routes. This decision was based on the fact that these trails were originally designed and located to accommodate hikers and stock animals. Any conversion of trails to motorized use would involve site-specific analysis, design, mitigations, and possibly re-routing and reconstruction. In addition, such conversion would introduce potential user conflicts as hikers and equestrian users were exposed to motorized vehicles. Non-motorized trails will continue to provide quiet recreation opportunities.

On the east side of the Forest there is a system of roads seasonally managed as snowmobile trails through the State of California OHV Grants Program. This trail system is the only snowmobile trail system on the Forest and provides approximately 140 miles of groomed snowmobiling trails. There is currently a Forest Order in place that sets seasons of use for different types of vehicles on these routes to avoid conflict between snowmobile use and use of other motorized vehicles.

Recreation Opportunity Spectrum

Five of the six ROS classes exist on the KNF. Almost 70% of the Forest is in an ROS class that allows construction and use of roads (Semi-Primitive Motorized, Roaded Natural, and Rural) (Table R-3); all inventoried unauthorized routes being analyzed in this project (497 miles) are within these ROS classes. If motorized vehicle use were permitted elsewhere, it would conflict with direction for management of Primitive and Semi-Primitive Non-Motorized ROS classes on the remaining 31% of the KNF but that does not currently occur.

Table R-3. ROS acres in each class for all alternatives

ROS Class	Acreage	Percent of total Forest acres
Primitive	202,800	12%
Semi-Primitive Non-Motorized	317,795	19%
Semi-Primitive Motorized	38,739	2%
Roaded Natural	841,711	50%
Rural	287,595	17%
Total	**1,688,640**	**100%**

Environmental Consequences

This section discloses the environmental effects of each of the alternatives on recreation on the Forest. This analysis is focused on the effects of three management actions: (1) the prohibition of cross-country motorized travel, (2) additions of currently unauthorized routes or areas to the national forest transportation system (NFTS), and (3) changes to the existing NFTS (i.e., changes in types of vehicles permitted). Nearly all forest visitors, regardless of the purpose for their visit, use the motorized transportation system to reach their destination. Changes to traditionally accepted forest practices, such as cross-country motorized travel, alter the diversity of motorized and non-motorized opportunities on the Forest. Visitors seeking a quiet, non-motorized experience generally use motorized vehicles to access trailheads, facilities, destinations, or geographic areas for non-motorized recreational activities.

Alternative 1

Under the no action alternative, the existing condition as described in the affected environment section would continue. More than 1.2 million acres would remain available for off-road motorized use. The Travel Management Rule would not be implemented, and a motor vehicle use map would not be produced.

Direct and indirect effects of the prohibition of cross-country motor vehicle travel

There is no prohibition of cross-country motorized use under this alternative. Motorized recreation opportunities would continue to be available on 497 miles of unauthorized routes and about 1.2 million acres, all in Rural, Roaded Natural, and Semi-Primitive Motorized ROS classes. The open riding area acreage and unauthorized motorized routes would not experience any changes or use restrictions. Unauthorized routes would continue to proliferate and have no status or authorization as NFTS facilities. To comply with the KNF LRMP, any new unauthorized routes would need to be within the Rural, Roaded Natural, and Semi-Primitive Motorized ROS classes because motorized use is prohibited in other ROS classes by the LRMP. It is not expected that new unauthorized routes would be created in other ROS classes. No net change in motorized recreation opportunities would occur, and as a result there would be no short or long term direct or indirect effects to motorized recreation opportunities.

The short-term and long-term effects of cross-country motorized travel include the increased potential for conflicts with users seeking a “quiet” recreation experience. In the long term, visitors seeking a “quiet” recreation experience would likely be displaced to areas on the western side of the Forest, including wilderness, backcountry, designated and recommended Wild River corridors, and in unroaded areas where steep topography naturally restricts cross-country motorized travel.

Access to dispersed recreation sites is not affected under this alternative. In both the short and long term, no change in motorized access to dispersed recreation activities would occur. The 322 identified sites would continue to be available, along with any other locations that recreationists can drive to.

Direct and indirect effects of adding facilities to the NFTS

No additions to the existing NFTS would be made under this alternative. No direct or indirect effects would result.

Direct and indirect effects of changes to the existing NFTS

No changes to the NFTS would be made for vehicle class under this alternative. No direct or indirect effects would result.

Cumulative effects

Under Alternative 1, cross-country motorized travel would continue to be allowed on approximately 1.2 million acres on the Forest. Ongoing and reasonably foreseeable actions that may affect recreation in the long term include addition of 13 miles of ML 1 road (closed to public motorized vehicle use) and 26 miles of ML 2 road (open to public motorized vehicle use) to the NFTS, and removal of 50 miles of ML 2 road.

The effects of this alternative, added to the effects of ongoing and foreseeable actions, would result in a reduction of 24 miles of motorized (road-related) opportunity for those who utilize the NFTS. This would have a slight negative effect on opportunities for motorized recreation. Since there is no prohibition on cross-country travel, vehicles can legally access any portion of the 1.2 million acres open to vehicles. Impacts to quiet recreation and the wilderness resource would not be substantially affected by the reduction of 24 miles of road open to motorized vehicle use. The cumulative effects of this alternative on quiet recreation are slightly more positive than the direct and indirect effects.

Alternative 2

Direct and indirect effects of the prohibition of cross-country motor vehicle travel

Prohibiting cross-country motorized travel does not have any effect on ROS classes because no motorized travel currently occurs in Primitive or Semi-Primitive Non-Motorized ROS classes; these ROS classes do not allow motorized use.

The prohibition of cross-country vehicle use will have a beneficial effect on non-motorized recreation opportunities in both the short and long term due to a reduction in noise, dust, and physical presence over 1.2 million acres of land. Potential user conflicts would be reduced for

quiet recreation enthusiasts across the Forest, as the potential for contact between hikers, horseback riders, and motorized vehicles off designated roads would be greatly reduced.

Prohibiting cross-country motorized vehicle travel will result in loss of 1.2 million acres of off-road motorized recreation opportunity.

Prohibiting cross-country motorized travel will have a negative effect on motorized access to dispersed recreation. Motorized access will be limited to 258 identified dispersed recreation sites (camping sites or river access points) or sites immediately adjacent to designated roads and trails. Opportunities to access dispersed recreation sites further than 30 feet from designated roads and trails by vehicle would be foregone in both the short and long term.

The prohibition on cross-country travel will reduce dust, noise and presence adjacent to four different wilderness areas.

Direct and indirect effects of adding facilities to the NFTS

All proposed route additions under this alternative are located in Semi-Primitive Motorized, Roaded Natural, or Rural ROS classes; this is consistent with direction in the LRMP. All routes proposed for addition to the NFTS comply with the ROS class in the associated management area.

Areas within ½ mile of added routes (about 59,000 acres) would continue to be affected by noise and potentially by dust. These negative effects on non-motorized recreation users will persist over the long term. At this time, it is not anticipated that adding these routes to the NFTS will generate additional use for the reasons identified in the Society, Culture and Economy section of this chapter. Site-specific mitigations to improve recreation experiences and protect other resources are listed in Table R-4.

This alternative proposes to add 24 miles of road to the NFTS to access dispersed recreation sites, and about 54 miles of road to provide a diversity of motorized opportunities (78 miles in all). Adding presently unauthorized routes will have a beneficial effect on motorized opportunities. These routes were identified by the public as important, high-value routes. The addition of 14 miles of motorized trails would contribute to a variety of experiences with easy to extremely difficult riding experiences for all trail class vehicles (Table R-5). Creation of two open riding areas, Humbug Open Riding Area at 5 acres and Juniper Flat Open Riding Area at 60 acres, is a benefit for those who wish to recreate off designated routes. Implementation of a season of use in the Humbug drainage (including the open riding area) of May 1 through October 31 would limit motorized opportunities in the short and long term for a relatively large number of local off-road riders. This reduction of acres available for off-road travel constitutes a loss of opportunity for motorized recreation for local off-road riders in both the short and long term. The Juniper Flat Open Riding Area will be available year round.

The proposed route additions provide motorized access to 258 dispersed recreation sites. Designation of these routes would ensure that individuals who need or want motorized access to dispersed recreation sites can continue to have these opportunities away from the traffic and potential dust of primary access routes.

This alternative proposes to add 1.52 miles of unauthorized routes to dispersed recreation sites within ½ mile of wilderness boundaries. These 32 routes (average length 250') all take off from NFTS roads at a point within ½ mile of a wilderness boundary. Dust impacts should be minimal as these routes are rough-surfaced and not suitable for high speeds. Noise impacts from these short routes will be indistinguishable from those occurring on adjacent ML 2 roads.

Direct and indirect effects of changes to the existing NFTS

Alternative 2 proposes mixed use (by highway legal and non-highway legal vehicles) on about 119 miles of NFTS roads, limits use to highway legal vehicles only on 10 miles of road[3] where non-highway legal vehicle use is currently allowed, and proposes converting two ML 1 roads[4] (10 miles that are currently closed to motorized use) to ML 2 (open to highway legal and non-highway legal vehicle use). The added mileage would be available for all vehicle classes. Since these changes will occur on the existing NFTS, they do not affect ROS designations or non-motorized recreation opportunities.

Changing the maintenance class of two roads from ML 1 to ML 2 will benefit motorized recreation by providing an additional 10 miles of road for use by all classes of motor vehicles and a loop opportunity to a scenic vista.

The addition of mixed use road mileage would benefit motorized recreation by connecting various ML 2 road systems, thereby providing loop opportunities for OHV enthusiasts. The loss of mixed use on 10 miles of road currently open to non-highway legal vehicles would be a negative impact; however, the roads proposed for removal of mixed use dead-end at private property and do not access recreation destinations or provide loop opportunities.

Cumulative effects

Ongoing and reasonably foreseeable actions that may affect recreation in the long term include addition of 13 miles of ML 1 road (closed to public motorized vehicle use) and 26 miles of ML 2 road (open to public motorized vehicle use) to the NFTS, and removal of 50 miles of ML 2 road.

[3] After publication of the NOI, it was determined that one road (approximately 2 miles) was not an NFTS road but was under the jurisdiction of Siskiyou County; therefore, no limitation to highway legal vehicles only on this road would be part of this KNF decision.
[4] After publication of the NOI, it was determined that one NFTS road (approximately 5 miles) had been converted from ML1 to ML2 in an earlier decision, so public motorized use is already available on this road.

The effects of this alternative, added to the effects of ongoing and foreseeable road-related actions, would result in the addition of 54 miles of open road and 14 miles of motorized trails, and conversion of 10 miles of ML 1 road to ML 2. There would be a gain in the road-related opportunity (and a loss of quiet recreation opportunity) on the east side of the Forest where 25 miles would be added through ongoing and reasonably foreseeable actions.

Cumulatively, this alternative would negatively affect opportunities for motorized recreation, especially on the west side of the KNF, when added to the motorized recreation opportunities lost by the prohibition on cross-country travel. Impacts to quiet recreation and the wilderness resource would be improved by the prohibition of cross-country travel; that would be slightly offset by the addition of the 92 miles of NFTS road and trails open to motorized vehicle use, plus the conversion of 10 miles of NFTS road from ML 1(closed to motorized use) to ML 2 (open to motorized use), minus the 24 miles closed by ongoing and reasonably foreseeable actions. The cumulative effects of this alternative on quiet recreation are slightly more positive than the direct and indirect effects. Overall, including the effects of prohibition of cross-country travel, there would be some negative effects to motorized recreation opportunities, offset somewhat by the addition of 78 miles of motorized access on designated roads and trails. There would generally be positive impacts to non-motorized recreation opportunities because of the prohibition of cross-country travel.

Alternative 3

Direct and indirect effects of the prohibition of cross-country motor vehicle travel

The positive and negative effects of prohibiting cross-country motorized travel are the same as those described under Alternative 2.

Direct and indirect effects of adding facilities to the NFTS

No additions to the existing NFTS would be made under this alternative. There would be negative effects, especially to individuals seeking motorized access to dispersed recreation sites, of not adding facilities.

Direct and indirect effects of changes to the existing NFTS

No changes to the NFTS in regards to vehicle class, or class of roads and trails, would occur under this alternative. No direct or indirect effects would result.

Cumulative effects

Under Alternative 3, the cumulative effects include the addition of the effects of prohibiting cross-country travel to the effects of ongoing and foreseeable road-related actions. Road-related actions will add 13 miles of ML 1 road (closed to public motorized vehicle use) and 26 miles of

ML 2 road (open to public motorized vehicle use) to the NFTS, and remove 50 miles of ML 2 road.

The effects of this alternative, added to the effects of ongoing and reasonably foreseeable actions, would result in a reduction of 24 miles of open road. There would be a gain in the road-related opportunity (and a loss of quiet recreation opportunity) on the east side of the Forest with a gain of 25 miles of road open to motorized use from ongoing and reasonably foreseeable actions, and a loss on the west side with the addition of 1 mile and removal of 50 miles of road from motorized vehicle use.

This would negatively affect opportunities for motorized recreation, especially on the west side of the KNF, added to the motorized recreation opportunities lost by the prohibition on cross-country travel. Impacts to quiet recreation and the wilderness resource would be improved by the prohibition of cross-country travel. The cumulative effects of this alternative on both quiet recreation and motorized recreation are slightly greater than the direct and indirect effects. Overall, including the effects of prohibition of cross-country travel, there would be substantial negative effects on motorized recreation opportunities, and positive impacts to quiet, non-motorized recreation opportunities except for those that depend on motorized access to reach non-motorized recreation settings.

Alternative 4

Direct and indirect effects of the prohibition of cross-country motor vehicle travel

The positive and negative effects of prohibiting cross-country motorized travel are the same as those described under Alternative 2.

Direct and indirect effects of adding facilities to the NFTS

All proposed route additions under this alternative are located in Semi-Primitive Motorized, Roaded Natural, or Rural ROS classes; this is consistent with direction in the LRMP. All routes proposed for addition to the NFTS comply with the ROS class in the associated management area.

Areas within ½ mile of added routes (about 4,480 acres) would continue to be affected by noise, physical presence and dust. These negative effects on non-motorized recreation users will persist over the long term. At this time, we do not anticipate that adding these routes to the NFTS will generate additional use, as described under Alternative 2. Site-specific mitigations to improve recreation experiences and protect other resources are listed in Table R-4.

This alternative proposes to add 1.7 miles of road to the NFTS to access dispersed recreation sites, and about 4.5 miles of road to provide a diversity of motorized opportunities (6.2 miles in

all). These routes were identified by the public as important, high-value routes. In addition, less than a mile of motorized trail would be added to the NFTS, which would provide easy and moderate riding opportunities but no trails at the difficult or extremely difficult levels. No open riding areas would be added to the NFTS. There would be some beneficial effect on motorized opportunities, but they are slight compared to other action alternatives. Implementation of a season of use on the one short (0.29 miles) motorized trail being proposed in the Humbug drainage would slightly limit motorized opportunities in the short and long term for some local off-road riders.

Alternative 4 proposes motorized access to 25 dispersed recreation sites. Opportunities for motorized access to dispersed recreation sites would be very limited under this alternative, although some motorized access would be provided for individuals to enjoy this activity.

This alternative does not propose any route additions within ½ mile of wilderness areas.

Direct and indirect effects of changes to the existing NFTS

Alternative 4 proposes mixed use (by highway legal and non-highway legal vehicles) on about 119 miles of NFTS roads, limits use to highway legal vehicles only on 8 miles of road where non-highway legal vehicle use is currently allowed, and proposes converting one ML 1 road (5 miles) that is currently closed to motorized use to ML 2 (open to highway legal and non-highway legal vehicle use). Since these changes will occur on the existing NFTS, they do not affect ROS designations or non-motorized recreation opportunities.

Changing the maintenance class of one road from ML 1 to ML 2 will benefit motorized recreation by providing an additional 5 miles of road for use by all classes of motor vehicles and a loop opportunity to a scenic vista.

The addition of mixed use road mileage would benefit motorized recreation by connecting various ML 2 road systems, thereby providing loop opportunities for OHV enthusiasts. The loss of mixed use on 8 miles of road currently open to non-highway legal vehicles would be a negative impact; however, the roads proposed for removal of mixed use dead-end at private property and do not access recreation destinations or provide loop opportunities.

Cumulative effects

Road-related actions will add 13 miles of ML 1 road (closed to public motorized vehicle use) and 26 miles of ML 2 road (open to public motorized vehicle use) to the NFTS, and remove 50 miles of ML 2 road.

The effects of this alternative, added to the effects of ongoing and foreseeable actions, would result in the loss of 18 miles of open road and gain of less than 1 mile of motorized trail, and

conversion of 5 miles of ML 1 road to ML 2. There would be a gain in the road-related opportunity (and a loss of quiet recreation opportunity) on the east side of the Forest with a gain of 25 miles of ML 2 road, and a loss on the west side with the addition of 1 mile and removal of 50 miles of road from motorized vehicle use through ongoing and reasonably foreseeable actions.

This alternative would affect opportunities for motorized recreation, especially on the west side of the KNF, added to the motorized recreation opportunities lost by the prohibition on cross-country travel. Impacts to quiet recreation and the wilderness resource would be improved by the prohibition of cross-country travel; the combination of adding 6 miles of roads and opening 5 miles of closed road minus the 24 miles of NFTS road removed through ongoing and reasonably foreseeable actions would result in a loss of motorized recreation opportunity. The cumulative effects of this alternative on quiet recreation are slightly more positive than the direct and indirect effects. Overall, including the effects of prohibition of cross-country travel, there would be substantial negative effects on motorized recreation opportunities, and positive impacts to non-motorized recreation opportunities except for those that depend on motorized access to reach non-motorized opportunities.

Alternative 5

Direct and indirect effects of the prohibition of cross-country motor vehicle travel

The positive and negative effects of prohibiting cross-country motorized travel are the same as those described under Alternative 2.

Direct and indirect effects of adding facilities to the NFTS

All proposed route additions under this alternative are located in Semi-Primitive Motorized, Roaded Natural, or Rural ROS classes; this is consistent with direction in the LRMP. All routes proposed for addition to the NFTS comply with the ROS class in the associated management area.

Areas within ½ mile of added routes (about 43,860 acres) would continue to be affected by noise, physical presence and dust. These negative effects on non-motorized recreation users will persist over the long term. At this time, we do not anticipate that adding these routes to the NFTS will generate additional use, as described under Alternative 2. Site-specific mitigations to improve recreation experiences and protect other resources are listed in Table R-4.

This alternative proposes to add about 30 miles of road to the NFTS to access dispersed recreation sites, and about 17 miles of road to provide a diversity of motorized opportunities (47 miles in all). These routes were identified by the public as important, high-value routes. The addition of about 22 miles of motorized trails would contribute to a variety of experiences with easy to extremely difficult riding experiences for all trail class vehicles. Implementation of a

season of use in the Humbug area (including the open riding area) would limit motorized opportunities in the short and long term for a relatively large number of local off-road riders.

The proposed route additions provide motorized access to 206 dispersed recreation sites. Designation of these routes would ensure that individuals who depend on motorized access can continue to enjoy dispersed recreation opportunities away from the traffic and dust of primary access routes.

This alternative proposes to add 1.53 miles of unauthorized routes to dispersed recreation sites within ½ mile of wilderness boundaries. These 22 routes (average length 360') all take off from NFTS roads at a point within ½ mile of a wilderness boundary. Dust impacts should be minimal as these routes are rough-surfaced and not suitable for high speeds. Noise impacts from these short routes will be indistinguishable from those occurring on the adjacent ML 2 roads.

Direct and indirect effects of changes to the existing NFTS

Alternative 5 proposes mixed use (by highway legal and non-highway legal vehicles) on about 272 miles of NFTS roads, limits use to highway legal vehicles only on 8 miles of road where non-highway legal vehicle use is currently allowed, and proposes converting one ML 1 road (5 miles) that is currently closed to motorized use to ML 2 (open to highway legal and non-highway legal vehicle use). The added mileage would be available for all vehicle classes. Since these changes will occur on the existing NFTS, they do not affect ROS designations or non-motorized recreation opportunities.

Changing the maintenance class of one road from ML 1 to ML 2 will benefit motorized recreation by providing an additional 5 miles of road for use by all classes of motor vehicles and a loop opportunity to a scenic vista.

The addition of mixed use road mileage would benefit motorized recreation by connecting various ML 2 road systems, thereby providing loop opportunities for OHV enthusiasts. The loss of mixed use on 8 miles of road currently open to non-highway legal vehicles would be a negative impact; however, the roads proposed for removal of mixed use dead-end at private property and do not access recreation destinations or provide loop opportunities.

Cumulative effects

Road-related actions will add 13 miles of ML 1 road (closed to public motorized vehicle use) and 26 miles of ML 2 road (open to public motorized vehicle use) to the NFTS, and remove 50 miles of ML 2 road.

The effects of this alternative, added to the effects of ongoing and foreseeable actions, would result in the addition of 23 miles of open road and 22 miles of motorized trails, and conversion of

5 miles of ML 1 road to ML 2. There would be a gain in the road-related opportunity (and a loss of quiet recreation opportunity) on the east side of the Forest with a gain of 25 miles of ML 2 road, and a loss on the west side with the addition of 1 mile and removal of 50 miles of road from motorized vehicle use from ongoing and reasonably foreseeable actions.

This alternative would affect opportunities for motorized recreation, especially on the west side of the KNF, added to the motorized recreation opportunities lost by the prohibition on cross-country travel. Impacts to quiet recreation and the wilderness resource would be improved by the prohibition of cross-country travel that would be slightly offset by the addition of the 69 miles of NFTS roads and trails open to motorized vehicle use, and the conversion of 5 miles of ML 1 to ML 2, minus the 24 miles closed by ongoing and reasonably foreseeable actions for an additional 50 miles of open road or trail. The cumulative effects of this alternative on quiet recreation are slightly more positive than the direct and indirect effects. Overall, including the effects of prohibition of cross-country travel, there would be negative effects on motorized recreation opportunities, offset somewhat by the net gain of 50 designated miles. There would be positive impacts to non-motorized recreation opportunities from the prohibition of cross-country motorized travel.

Alternative 6

This alternative is based on corrections to the proposed action. When Alternative 2 was field checked, a number of the proposed routes were found to have limited value for OHV travel – they were short dead-end spurs, did not provide a loop opportunity, or did not access dispersed recreation sites or features. Others were inappropriate for inclusion in the NFTS due to slope, vegetation, or other resource conflicts. This alternative includes some of the routes in Alternative 2, and proposes additional routes and mixed use to provide for more access and motorized recreation opportunity.

Direct and indirect effects of the prohibition of cross-country motor vehicle travel

The positive and negative effects of prohibiting cross-country motorized travel are the same as those described under Alternative 2.

Direct and indirect effects of adding facilities to the NFTS

All proposed route additions under this alternative are located in Semi-Primitive Motorized, Roaded Natural, or Rural ROS classes; this is consistent with direction in the LRMP. All routes proposed for addition to the NFTS comply with the ROS class in the associated management area.

Areas within ½ mile of added routes (about 37,760 acres) would continue to be affected by the dust and noise generated by motorized activity. These negative effects on non-motorized

recreation users will persist over the long term. At this time, we do not anticipate that adding these routes to the NFTS will generate additional use, as described under Alternative 2. Site-specific mitigations to improve recreation experiences and protect other resources are listed in Table R-4.

Adding presently unauthorized routes would have a beneficial effect on motorized opportunities. This alternative proposes to add 26 miles of road to the NFTS to access dispersed recreation sites, and about 15 miles of road to provide a diversity of motorized opportunities (41 miles in all). The addition of about 18 miles of motorized trails would contribute to a variety of experiences with easy to extremely difficult riding experiences for all trail class vehicles. Implementation of a season of use in the Humbug area (including the open riding area) would limit motorized opportunities in the short and long term for a relatively large number of local off-road riders.

The proposed route additions provide motorized access to 164 dispersed recreation sites. Designation of these routes would ensure that individuals who depend on motorized access can continue to enjoy dispersed recreation opportunities away from the traffic and dust of primary access routes.

This alternative proposes to add 0.87 miles of unauthorized routes to dispersed recreation sites within ½ mile of wilderness boundaries. These 19 routes (average length 240') all take off from NFTS roads at a point within ½ mile of a wilderness boundary. Dust impacts should be minimal as these routes are rough-surfaced and not suitable for high speeds. Noise impacts from these short routes will be indistinguishable from those occurring on the adjacent ML 2 roads.

Direct and indirect effects of changes to the existing NFTS

Alternative 6 proposes mixed use (by highway legal and non-highway legal vehicles) on about 105 miles of NFTS roads, limits use to highway legal vehicles only on 8 miles of road where non-highway legal vehicle use is currently allowed, and proposes converting one ML 1 road (5 miles) that is currently closed to motorized use to ML 2 (open to highway legal and non-highway legal vehicle use). Since these changes will occur on the existing NFTS, they do not affect ROS designations or non-motorized recreation opportunities.

Changing the maintenance class of one road from ML 1 to ML 2 will benefit motorized recreation by providing an additional 5 miles of road for use by all classes of motor vehicles and a loop opportunity to a scenic vista.

The addition of mixed use road mileage would benefit motorized recreation by increasing the diversity of motorized opportunities and (by connecting various ML 2 road systems) provide loop opportunities for OHV enthusiasts. The loss of mixed use on 8 miles of road currently open to non-highway legal vehicles would be a negative impact; however, the roads proposed for

highway legal vehicles only dead-end at private property and do not access recreation destinations or provide loop opportunities.

Cumulative effects

Road-related actions will add 13 miles of ML 1 road (closed to public motorized vehicle use) and 26 miles of ML 2 road (open to public motorized vehicle use) to the NFTS, and remove 50 miles of ML 2 road.

The effects of this alternative, added to the effects of ongoing and foreseeable actions, would result in the addition of 17 miles of road and 18 miles of motorized trails, and conversion of 5 miles of ML 1 road to ML 2. There would be a gain in the road-related opportunity (and a loss of quiet recreation opportunity) on the east side of the Forest with a gain of 25 miles of ML 2 road, and a loss on the west side with the addition of 1 mile and removal of 50 miles of road from motorized vehicle use due to ongoing and reasonably foreseeable actions.

This alternative would affect opportunities for motorized recreation, especially on the west side of the KNF, added to the motorized recreation opportunities lost by the prohibition on cross-country travel. Impacts to quiet recreation and the wilderness resource would be improved by the prohibition of cross-country travel that would be slightly offset by the addition of the 59 miles of NFTS roads and trails open to motorized vehicle use minus the 24 miles closed by ongoing and reasonably foreseeable actions. The cumulative effects of this alternative on quiet recreation are slightly greater than the direct and indirect effects. Overall, including the effects of prohibition of cross-country travel, there would be negative effects on motorized recreation opportunities, offset somewhat by the additional 40 miles of motorized opportunity. There would be positive impacts to non-motorized recreation opportunities due to the prohibition of motorized cross-country travel.

Alternative 7

Direct and indirect effects of the prohibition of cross-country motor vehicle travel

The positive and negative effects of prohibiting cross-country motorized travel are the same as those described under Alternative 2.

Direct and indirect effects of adding facilities to the NFTS

All proposed route additions under this alternative would be located in Semi-Primitive Motorized, Roaded Natural, or Rural ROS classes, which is consistent with direction in the LRMP. All routes proposed for addition to the NFTS comply with the ROS class in the associated management area.

Areas within ½ mile of added routes (about 47,360 acres) would continue to be affected by the dust and noise generated by motorized activity. These negative effects on non-motorized recreation users will persist over the long term. At this time, we do not anticipate that adding these routes to the NFTS will generate additional use, as described under Alternative 2. Site-specific mitigations to improve recreation experiences and protect other resources are listed in Table R-4.

Adding presently unauthorized routes, and opening one ML1 road (about 5 miles) to public use, would have a beneficial effect on motorized opportunities. This alternative proposes to add 28 miles of road to the NFTS to provide a diversity of motorized opportunities, 14 miles for motorized use by all vehicles and 14 miles for highway-legal vehicles only. The addition of about 21 miles of motorized trails would contribute to a variety of experiences with easy to extremely difficult riding experiences for all trail class vehicles. Implementation of a season of use in the Humbug area (including the open riding area) would limit motorized opportunities in the short and long term for a relatively large number of local off-road riders.

The proposed route additions provide 25 miles of motorized access to 192 dispersed recreation sites. Designation of these routes would ensure that individuals who depend on motorized access can continue to enjoy dispersed recreation opportunities away from the traffic and dust of primary access routes.

This alternative proposes to add 1.51 miles of unauthorized routes to dispersed recreation sites within ½ mile of wilderness boundaries. These 21 routes (average length 240') all take off from NFTS roads at a point within ½ mile of a wilderness boundary. Dust impacts should be minimal as these routes are rough-surfaced and not suitable for high speeds. Noise impacts from these short routes will be indistinguishable from those occurring on the adjacent ML 2 roads.

Direct and indirect effects of changes to the existing NFTS

Alternative 7 proposes mixed use on about 131 miles of NFTS roads, prohibits mixed use on about 8 miles of road where it is currently allowed, and proposes to convert one ML 1 road (5 miles) to ML 2. Alternative 7 also proposes to convert 130 miles of ML 3 road to ML 2. This added mileage would be available for all vehicle classes. These changes do not affect ROS designations or non-motorized recreation opportunities.

Changing the maintenance class of one road from ML 1 to ML 2 will benefit motorized recreation by providing an additional 5 miles of road for use by all classes of motor vehicles and a loop opportunity to a scenic vista.

The addition of mixed use road mileage would benefit motorized recreation users by increasing the diversity of motorized opportunities, and connecting various ML 2 road systems that will provide loop opportunities for OHV enthusiasts. Converting 130 miles of ML 3 road to

ML 2 will allow all vehicle classes to use these roads; this would benefit motorized recreation users in the same way as a designation for mixed use. The loss of mixed use on 8 miles of road currently open to non-highway legal vehicles would be a negative impact; however, the road proposed for the removal of mixed use dead-ends at private property and does not access recreation destinations or provide loop opportunities.

Cumulative effects

Road-related actions will add 13 miles of ML 1 road (closed to public motorized vehicle use) and 26 miles of ML 2 road (open to public motorized vehicle use) to the NFTS, and remove 50 miles of ML 2 road.

The effects of this alternative, added to the effects of ongoing and foreseeable actions, would result in the addition of 29 miles of NFTS road open to motorized vehicle use (14 miles of which are open to highway-legal vehicles only) and 21 miles of motorized trails, and conversion of 5 miles of ML 1 road to ML 2. There would be a cumulative gain in the NFTS road-related opportunity (and a loss of quiet recreation opportunity) on the east side of the KNF with a gain of 25 miles of NFTS road open to motorized use and a loss of the west side with the addition of 1 mile and a loss of 50 miles of NFTS road removed by ongoing and reasonably foreseeable actions.

This alternative would affect opportunities for motorized recreation, especially on the west side of the KNF, added to the motorized recreation opportunities lost by the prohibition on cross-country travel. Impacts to quiet recreation and the wilderness resource would be improved by the prohibition of cross-country travel; this would be slightly offset by the addition of the 74 miles of NFTS roads and trails open to motorized vehicle use, and the 5 miles converted from ML 1 (closed to motorized vehicle use) to ML 2 (open to motorized vehicle use) minus the 24 miles closed by ongoing and reasonably foreseeable actions. The cumulative effects of this alternative on quiet recreation are slightly more positive than the direct and indirect effects. Overall, including the effects of prohibition of cross-country travel, there would be negative effects on motorized recreation opportunities, somewhat offset by the added 55 miles of motorized opportunity. There would be positive impacts to non-motorized recreation opportunities due to the prohibition of motorized cross-country travel.

Site-specific Mitigations for Recreation

Table R-4. Mitigation for unauthorized routes proposed for addition to NFTS.

Route ID	Improvement Work Required	Alternative	Mileage
7J001.11	Delineate route through signing, barriers or placement of brush	2,5,6,7	0.29
7J001.11A	Delineate route through signing, barriers or placement of brush	2 5,6,7	0.41
7J001.9	Delineate route through signing, barriers or placement of brush	2,5,6,7	0.84
8J002.3A	Delineate route through signing, barriers or placement of brush	5	0.14
45080104	Delineate route through signing, barriers or placement of brush	5,6,7	0.23
45080201	Delineate route through signing, barriers or placement of brush	5,6	0.14
45080202	Delineate route through signing, barriers or placement of brush	5,6	0.1
45080205	Delineate route through signing, barriers or placement of brush	2,5,6,7	0.74
45081203	Delineate route through signing, barriers or placement of brush	2	0.27
46082601	Establish tread/improve drainage	2,5,6,7	0.38
46083301	Establish tread/improve drainage; delineate route through signing, barriers or placement of brush	2,5,6,7	1.13
46083401	Delineate route through signing, barriers or placement of brush	2,5,6,7	2.43
46083502	Develop switchbacks on steep portions, delineate route through signing, barriers or placement of brush	2,5,6,7	0.94
46083503	Delineate route through signing, barriers or placement of brush	2,5,6,7	0.38
Humbug Open Riding Area	Define perimeter with signs, fencing or other barriers; install kiosk with rules, regulations and tread lightly information.	2,5,6,7	5 acres

Route ID	Improvement Work Required	Alternative	Mileage
Juniper Flat Open Riding Area	Define perimeter with signs, fencing or other barriers; install kiosk with rules, regulations and tread lightly information.	2,5,6,7	48 acres

Summary of Effects Across All Alternatives

All the alternatives analyzed comply with ROS direction from the LRMP. All routes proposed for addition to the NFTS comply with the ROS class in the associated management area.

For every alternative except Alternative 1, the prohibition on cross-country motorized travel will substantially improve the number of acres available exclusively for non-motorized recreation on the Klamath NF. Under Alternative 1, quiet recreation on 1.2 million acres will continue to be impacted by the noise and dust generated by motorized activity. All action alternatives increase acreage available for quiet recreation (outside ½ mile from routes open to motorized travel); Alternative 3 and 4 more than other action alternatives.

Alternative 1 provides the greatest opportunity for motorized use on the Forest, because it continues to allow vehicle use of 1.2 million acres and motorized access to any site on that acreage. As displayed in Table R-5, Alternatives 5, 6 and 7 do not accommodate off-road use but do provide a diversity of motorized recreation opportunity on roads and trails, including motorized access to a large number of identified dispersed recreation sites. Alternatives 3 and 4 do not accommodate off-road travel, and provide little or no added motorized recreation opportunity.

Alternative 1 continues to allow motorized access (through cross-country travel) up to wilderness boundaries. The action alternatives all limit the number and mileage of unauthorized routes proposed for addition to the NFTS within ½ mile of wilderness boundaries. Action alternatives also reduce conflict among types of recreation visitors by prohibiting cross-country motorized travel which reduces conflicts between motorized vehicle users and non-motorized KNF users. Alternatives 2, 4, 5, 6, and 7 remove non-highway legal vehicles from routes dead ending at private land, providing more quiet recreation opportunity near or on private land.

Table R-5. Comparison of the Alternatives

	Number of Routes, Mileage and Acres Proposed to be Added to NFTS						
	Alt 1	**Alt 2**	**Alt 3**	**Alt 4**	**Alt 5**	**Alt 6**	**Alt 7**
Miles of Motorized Additions - Roads	0	78	0	6	47	41	53
Miles of Road Added by Season of Use	0	8* 1** 69***	0	0* 0** 6***	1* 1** 45***	<1* 1** 39***	1* 0** 52***
Miles of Road Added by Vehicle Type	0	1 HLO 77 All	0	<1 HLO 6 All	1HLO 46 All	1HLO 40 All	14HLO 39 All
Miles of Motorized Additions - Trails	0	14	0	1	22	18	21
Miles of Motorized Trail Added by Season of Use	0	14* 0** 1***	0	<1* 0** <1***	21* 0** <1***	18* 0** <1***	20* 0** <1***
Miles of Motorized Trail Added by Vehicle Type	0	2.1 All 3.8 Mot 8.3 <50”	0	0.7 All 0 Mot 0 <50”	4.5 All 3.8 Mot 13.5 <50”	4.5 All 3.6 Mot 10.4 <50”	3.4 All 3.8 Mot 13.3 <50”
Acres open to Cross-Country Travel (in Alt 1) or as Open Riding Areas	1.2 million	65	0	0	53	53	53
Acres of Open Area by Season of Use and Vehicle Type	1.2 million*** All Vehicles	5* 60*** All Vehicles	0	0	5* 48*** All Vehicles	5* 48*** All Vehicles	5* 48*** All Vehicles
# of Access Routes to Dispersed Recreation Sites	Not calculated[a]	258	0	25	206	164	192
Acres within ½ mile of added routes	224,871	58,880	0	4,480	43,860	37,760	47,360
Miles (#) of Route Additions within ½ mile of wilderness boundaries	0	1.52 (32)	0	0	1.53 (22)	0.87 (19)	1.51 (21)
Miles of NFTS Road with Mixed Use Added/ Miles of ML 3 Road Converted to ML 2	0	119	0	119	272	105	131 (130)
Miles of NFTS Road with Mixed Use Removed[b]	0	10	0	8	8	8	8
Total Resulting NFTS Roads (ML 1-5)	4536	4614	4536	4542	4583	4577	4589

a - For alternative 1, any site that can be accessed by vehicle can be considered a dispersed recreation site. It is not possible to calculate the # of such sites for which motorized access is feasible.
b - Where such use is currently allowed.
* - Season of Use 5/1 through 10/31;** - Season of Use 8/16 through 4/14;*** - Year round
HLO=Highway Legal Only; Mot=motorcycles only; <50” = motorized vehicles less than 50” in width

The total number of miles of NFTS roads that would result from each alternative being implemented is displayed in Table R-7. This table also displays the total resulting miles of road open for motorized use, and the total resulting miles of road open for mixed use (by highway legal and non-highway legal vehicles). Resulting miles of recreational opportunity for motorized recreation would be least in Alternative 3 and greatest in Alternative 1. The number of miles of open NFTS road would be least in Alternative 3, greatest in Alternative 2, and similar for Alternatives 5, 6, and 7 with small differences among action alternatives. Opportunities for motorized use by non-highway legal vehicles on NFTS roads would be greatest in Alternatives 5 and 7, slightly less in Alternatives 2, 4 and 6, and least in Alternatives 1 and 3.

Table R-7. Comparison of Motorized Vehicle Use Opportunities Resulting from the Alternatives

Action		Alt. 1	Alt. 2	Alt. 3	Alt. 4	Alt. 5	Alt. 6	Alt. 7
Total Miles of NFTS Roads (ML 1- ML 5) (miles)	**Resulting from Alt.**	4536	4614	4536	4542	4583	4577	4589
	Resulting from Alt. and ongoing and reasonably foreseeable actions	4525	4603	4525	4531	4572	4566	4578
Total Miles Open To Motorized Vehicle Use (Hwy-legal vehicles)	**Unauthorized NFTS Roads[5]**	497	0	0	0	0	0	0
	Combined Total (miles)	3686 4183	3774 3774	3686 3686	3697 3697	3738 3738	3732 3732	3744 3744
Total Miles Open to Mixed Use (Hwy-legal and non-hwy legal vehicles)	**Unauthorized NFTS Roads[6]**	497	0	0	0	0	0	0
	Combined Total (miles)	2737 3234	2933 2933	2737 2737	2859 2859	3052 3052	2879 2879	3034 3034

Motorized trails proposed by Alternatives 2, 4, 5, 6, and 7 provide for varying riding experiences and degrees of difficulty as displayed in Table R-8. Information on which specific

[5] Existing NFTS roads open to motorized vehicles plus (1) routes added as open ML 2 NFTS roads by alternative; (2) the sum of open ML 2 NFTS roads added by ongoing and reasonably foreseeable actions minus roads closed or removed from the NFTS by ongoing and reasonably foreseeable actions; and (3) closed NFTS ML1 roads converted to open ML 2 roads by alternative.

[6] Existing NFTS ML 2 roads open to highway legal and non-highway legal motorized vehicles (mixed use) plus (1) routes added as ML 2 NFTS roads open to highway legal and non-highway legal motorized vehicles by alternative; (2) the sum of open ML 2 NFTS roads added by ongoing and reasonably foreseeable actions minus roads closed or removed from the NFTS by ongoing and reasonably foreseeable actions; (3) closed NFTS ML1 roads converted to open ML 2 roads by alternative; (4) existing NFTS ML 3 roads on which mixed use is allowed by alternative; (5) existing NFTS ML 3 roads converted to ML 2, thus allowing mixed use; minus NFTS ML 2 roads on which mixed use is removed, making them available only to highway legal vehicles.

trails provide what levels of difficulty is stored in the project records for this project, available at the KNF Forest Supervisor's office in Yreka, CA.

Table R-8. Proposed NFTS trail additions by alternative by degree of difficulty

Class of Vehicle	Degree of Difficulty	Mileage Proposed to be Added to NFTS						
		1	2	3	4	5	6	7
Highway-legal High-Clearance 4WD	Easy	0	1.20	0	0.29	4.05	4.06	4.05
	Moderate		0.44		0.44	0.44	0.44	0.44
	Difficult		0		0	0	0	0
	Extremely Difficult		0.27		0	0	0	0
Dual Sport Highway-legal Motorcycle	Easy	0	4.56	0	0.29	7.61	7.40	7.61
	Moderate		3.10		0.44	5.87	5.20	4.83
	Difficult		6.04		0	8.29	5.82	8.29
	Extremely Difficult		0.27		0	0	0	0
Nonhighway-legal 4WD	Easy	0	1.20	0	0.29	4.05	4.06	4.05
	Moderate		0.44		0.44	0.44	0.44	0.44
	Difficult		0		0	0	0	0
	Extremely Difficult		0.27		0	0	0	0
Nonhighway-legal Motorcycle	Easy	0	4.56	0	0.29	7.61	7.40	7.61
	Moderate		3.10		0.44	5.87	5.20	4.83
	Difficult		6.04		0	8.29	5.82	8.29
	Extremely Difficult		0.27		0	0	0	0
Nonhighway-legal ATV	Easy	0	4.35	0	0.29	7.40	7.40	7.40
	Moderate		3.10		0.44	5.82	5.15	4.78
	Difficult		2.48		0	4.73	2.27	4.73
	Extremely Difficult		0.27		0	0	0	0

Compliance with the LRMP and Other Direction

Alternative 1 provides a broad range of motorized recreational opportunities, and allows cross-country motorized travel on Rural, Roaded Natural, and Semi-Primitive Motorized ROS classes. Compliance with standard 12-11 of the LRMP is achieved through implementation of various site-specific Forest Orders. Overall, Alternative 1 complies with standards in the LRMP. However, the LRMP, as written, is not in compliance with the Travel Management Rule.

With the exception of Alternative 3, the action alternatives all provide a range of recreational motorized opportunities and are in compliance with ROS classes. Alternative 3 would limit motorized recreational opportunities to existing NFTS roads, so there would be no motorized trails on the KNF. All action alternatives would require a Forest Plan amendment to prohibit cross-country motorized travel to meet the Travel Management Rule.

Wild and Scenic River Act

Portions of the Klamath, Scott, and Salmon Rivers were formally included within the National Wild and Scenic River (WSR) system in 1981, to protect their "outstandingly remarkable" fisheries values and their free-flowing condition. With the exception of one segment of the Scott River, these rivers are further classified as "Recreational" Wild and Scenic Rivers. The Recreational classification applies to those rivers or sections of rivers that are free-flowing, readily accessible by road or railroad, may have some development along the shorelines and may have undergone some impoundment or diversion in the past (USDA Forest Service, 1995). One segment of the Scott River is classified as a "Scenic" Wild and Scenic River, due to its largely undeveloped condition. The Scenic classification applies to those rivers or sections of rivers that are free of impoundments, with shorelines or watersheds still largely primitive and shorelines largely undeveloped, but may be accessible in places by roads (USDA Forest Service, 1995).

There are 15 unauthorized routes (3.8 miles) within WSR corridors. Alternatives 2, 5, 6 and 7 propose to add some of those routes to the NFTS. All proposed routes provide access to dispersed recreation sites (both camping sites and areas for launching watercraft) within WSR corridor segments designated as Recreational. Based on determinations in the Hydrology and Fisheries sections of this document, the additions would meet requirements of the Aquatic Conservation Strategy and the Clean Water Act sufficient to protect the outstandingly remarkable values of the Wild and Scenic Rivers. The Recreation analysis determined that all action alternatives meet Forest ROS standards; therefore, Alternatives 2, 5, 6 and 7 would meet LRMP standards and guidelines. More information is contained in the WSR Analysis paper included in the project files in the Klamath National Forest Supervisor’s Office in Yreka,

Transportation Management

Introduction

This section of the environmental analysis examines the extent to which the proposed action and alternatives respond to transportation facilities direction established in the LRMP. The NFTS, consisting of roads, trails, and airfields, provides for protection, development, management, and utilization of resources on the national forests. Other roads and trails on the KNF are not currently part of the NFTS; they are either managed by another agency or private entity, or are unauthorized. Transportation facilities considered in this analysis include routes that are suitable for motor vehicle use as roads or trails. Decisions regarding changes in the transportation facilities must consider: 1) providing for adequate public safety, and 2) providing adequate maintenance of the routes designated for public use. Adequate maintenance includes maintenance to protect the route from deterioration and make it useable for a class of vehicle as well as maintenance to protect the environmental values and resources of the KNF surrounding the route. The analysis in this section focuses primarily on these aspects.

Analysis Framework: Statute, Regulation, LRMP, and Other Direction

Direction relevant to the proposed action as it affects transportation facilities includes:

The National Forest Roads and Trails Act (FRTA) is the umbrella under which transportation is managed on National Forests.

The National Forest Management Act (NFMA) is the law under which National Forests developed land and resource management plans.

Title 36, Code of Federal Regulations, Part 212 (36 CFR 212) is the implementing regulation for the FRTA and includes portions of the Travel Management Rule published in the Federal Register on November 9, 2005. Part 212 provides criteria for designation of roads and trails. Providing safe transportation facilities and considering the affordability of maintaining the transportation facilities are two of the criteria. **36 CFR 212.55** requires public safety be considered when designating roads, trails and areas for motor vehicle use. **36 CFR 212.55** requires consideration of the need for maintenance and administration of the designated NFTS.

Forest Service Manuals 2350 and 7700 contain agency policy for management of the NFTS. The policy requires the development of trail management objectives (TMOs) and road management objectives (RMOs). The TMOs and RMOs document the purpose of each trail or road. The purpose for the trail or road sets the parameters for maintenance standards needed to meet user needs, resource protection and public safety.

Forest Service Handbook **7709.59** describes the maintenance management system the Forest Service uses and the maintenance standards needed to meet RMOs for the road system including considerations for public safety. Some of the terms describing road management and maintenance levels are as follows:

Affordability – 36 CFR 212.55 requires consideration of the need for maintenance and administration of the designated NFTS. Costs for the NFTS include costs for needed maintenance work that has not been completed for various reasons (deferred maintenance) and costs of maintenance that should be performed routinely to maintain the facility to its current standard (annual maintenance). There may be additional costs associated with proposed changes to the NFTS (implementation costs). These costs may be for improving unauthorized routes that will be added to the NFTS, costs for proposed safety and resource improvements, costs for changing maintenance levels, and costs for closing routes to use by motor vehicles.

Road Management Objective: Defines the intended purpose of an individual road in providing access to implement a land and resource management plan. Access needs are typically multi-purpose and may include forest health projects, wildlife monitoring, fire protection or suppression, and dispersed recreation such as hunting, camping and sightseeing.

Annual Maintenance: The expected yearly maintenance required on roads and roadsides based on the assigned Maintenance Level. The actual amount of maintenance required depends on the amount of use the road has received, the condition of the surface, the season of use and physical factors such as topography, soil type, vegetation and precipitation.

Deferred Maintenance: This maintenance work can be deferred, without loss of road serviceability, until such time as the work can be economically or efficiently performed. Deferred maintenance needs can be reduced through a number of different actions and strategies (Appendix C).

Road maintenance level (ML): The Forest Service maintains roads in 5 defined levels. The following terms are rewritten for ease of understanding and tailored to the Klamath National Forest. Official definitions can be found at http://www.fs.fed.us/cgi-bin/Directives/get_dirs/fsh?7709.59!.gov

Maintenance Level 5 roads are mostly double lane paved; they require care every year and significant mission and safety related maintenance every 8 – 10 years. These roads only make up 1 percent of the KNF transportation system.

Maintenance Level 4 roads are mostly chipsealed (gravel topcoat with asphalt binder) with some asphalt pavement sections that also require annual care and substantial mission and safety related maintenance every 8 – 10 years. These roads generally provide access to developed recreation and administrative sites and make up 2 percent of the KNF transportation system.

Maintenance Level 3 roads make up 18 percent of the KNF transportation system. Many of these roads were aggregate surfaced for heavy timber hauling and resurfacing is not required for current use. Much of the aggregate has been worn down and pounded into the native material leaving a stable roadbed that is graded only as necessary for proper drainage or for safety concerns. These roads are the backbone system to access the general forest and wilderness areas. The objective is to maintain these roads to be passable for a prudent driver in a passenger vehicle.

Maintenance Level 2 roads make up 61 percent of the KNF transportation system. The majority of these roads are maintained as needed to support Forest projects or provide access for fire suppression. Some of these roads may not see any maintenance for several years. In some cases, roads may become impassable due to rocks, down trees and encroaching brush. The objective is to maintain these roads for high clearance vehicles such as pickups and many SUVs; however, some may be passable by a lower clearance vehicle.

Maintenance Level 1 roads are closed to motorized vehicle use. They are generally placed into self-maintaining hydrologic storage and closed with a closure device. No maintenance is typically performed except to check the closure device. These roads make up 18 percent of the KNF transportation system.

The California Vehicle Code (CVC) regulates the use of motor vehicles in California, including motor vehicles used on national forests. The CVC sets safety standards for motor vehicles and vehicle operators. Division 1, Sec. 360 defines a highway as ‘A way or place of whatever nature, publicly maintained and open to the use of the public for purposes of vehicular travel. Highway includes street’. The exclusion of roads from the definition of a highway is defined in the CVC as follows:

Div 16.5, Sec. 38001: (a) Except as otherwise provided, this division applies to off-highway motor vehicles, as defined in Section 38006, on lands, other than a highway, that are open and accessible to the public, including any land acquired, developed, operated, or maintained, in whole or in part, with money from the Off-

Highway Vehicle Trust Fund, except private lands under the immediate control of the owner or his or her agent where permission is required and has been granted to operate a motor vehicle. For purposes of this division, the term "highway" does not include fire trails, logging roads, service roads regardless of surface composition, or other roughly graded trails and roads upon which vehicular travel by the public is permitted.

Oregon Revised Statutes (ORS) regulates the use of motor vehicles in Oregon, including motor vehicles used on the national forests. Per ORS 821.190, it is unlawful to operate a Class III vehicle on a highway, but exemptions are established in 821.200. One of these exemptions is "(2) a snowmobile or all-terrain vehicle may be lawfully operated upon a highway under any of the following circumstances…(c) Where the highway is posted to permit snowmobiles or all-terrain vehicles. ORS 821.200 states "The prohibitions and penalties under ORS 821.190 do not apply when a snowmobile or all-terrain vehicle that qualifies for the exemption from equipment requirements under ORS 821.010…"

The exemption noted above is described in ORS 821.020: Applicability of off-road vehicle exemption from general equipment requirements:

(1) This section establishes the areas where the exemption from equipment requirements for off-road vehicles described under ORS 821.010 is applicable. The exemption applies to any land, road or place within the State of Oregon that meets the description in subsection (2) of this section and that is not posted as closed to off-road use.

(2) The exemption applies to each of the following lands, roads and places:

(a) Lands that are open to the public.

(b) Roads, other than two-lane gravel roads, that are open to the public.

(c) Paved parking lots adjacent to or on designated off-road vehicle areas, trails and routes that are open to the public.

(d) Any local two-lane gravel road that is open to the public and that is designated by the road authority with jurisdiction over the road as open to off-road vehicles that are described in ORS 821.010. [1983 c.338 §711; 1999 c.565 §4]

The Regional Forester of the U.S. Forest Service, Pacific Southwest Region, has determined that KNF roads with operational maintenance levels 3, 4, and 5 do not meet the CVC 38001 highway definition exclusions. The Pacific Southwest Regional Forester's letters, file code 7700/2350, dated 08/21/06, 06/20/07, 01/13/09, and 2/12/09 contain procedures National Forests in the Pacific Southwest Region will follow to evaluate safety aspects of public travel on roads

when proposed changes to the NFTS will allow both highway-legal and non-highway-legal traffic on a road. This is termed motorized mixed use (MMU) by the Forest Service. The Oregon statutes allow the Forest Service to approve MMU on unpaved roads.

The Klamath National Forest Land and Resource Management Plan (LRMP) includes forest-wide goals for transportation and facilities management. Specific standards pertinent to travel management include:

20-1 Transportation planning shall be an integral part of Ecosystem Analysis at the landscape/watershed level and of environmental analysis at the site level. Planning efforts should include a review of the existing Road Management Objectives (RMOs) and proposals for the development of new roads. Develop RMOs through an ID team. Place needed non-system [now called unauthorized] roads in the Forest road system. Non-system roads not needed for future management shall be "put to bed."

20-4 Road closures may be permanent or seasonal. Road closures can be used to meet wildlife needs, water quality and soils protection objectives, fire protection, other resource needs, to reduce road damage and maintenance costs and to reduce or eliminate conflicts between user groups.

Effects Analysis Methodology

Assumptions Specific to the Transportation Analysis

- Any motor vehicle use authorized by state law is occurring on the NFTS unless there are Forest- specific prohibitions.
- Motor vehicle use by special use permit or other permitted activities are outside the scope of this proposal (forest products gathering, motorized special use permit event, recreation residences, mining activities, etc.).
- Once motorized trails are designated, unless they are specifically identified by the travel management decision as open only to a particular class of vehicle, they will be maintained for high-clearance vehicles (4WD etc.), ATVs and motorcycles.
- Some level of maintenance is required for every route open to motor vehicle use by the public, but many routes need little active maintenance.
- State law regulating motor vehicle drivers sets the standard of care for the safety of themselves and other users for the NFTS.

Data Sources

- GIS layers for KNF for locations of unauthorized routes.

- KNF Forest-wide Roads Analysis (2002) (this document provided an initial estimate of deferred maintenance costs of $55.5 million. In 2007, the estimate was revised to $48 million; both these numbers are based on a small national random road sample of deferred maintenance needs and are not considered statistically valid at the national forest level; more accurate numbers were developed in 2009 that are used in this travel management document).
- Analysis documented in Appendix C of this FEIS for KNF road maintenance strategies and related deferred maintenance costs.
- INFRA database for information on individual roads at various maintenance levels.

Indicators

Indicators of Public Safety

1. Miles of Unauthorized Routes Added to the NFTS

The 4,536 miles of KNF NFTS roads have very low traffic volumes and are predominantly low speed routes constructed in mountainous, heavily wooded terrain. These roads can present hazards such as steep drop offs or debris in the road, but can be used safely by a prudent drivers taking proper precautions. The Klamath visitor map advises motorists of driving hazards and recommends safety and survival gear to take along. Accidents and especially fatalities are rare and, when they occur, usually involve a single vehicle. There are several factors contributing to the low rate of safety related problems:

- The KNF roads are safe if driven responsibly
- The KNF is not located near any major urban centers
- Siskiyou County is 60 percent public land with a total population of 45,000
- The KNF has one of the lowest visitor use numbers in the nation
- There are no large developed recreation sites that concentrate high numbers of vehicles
- Use is widely dispersed for activities such as hunting, fishing or wood cutting
- Visitors are typically accustomed to mountain roads and many drive high clearance vehicles

KNF engineers and other employees review NFTS road conditions on a continuing basis. Given the NFTS size, use patterns and debris fall, not every road is driven or drivable. Identified safety hazards, such as bridge deficiencies, evaluated danger trees (formerly known as hazard

trees) or major washouts are corrected or the road is closed. Maintenance funds are prioritized to deal with safety concerns first.

The Forest has 497 miles of publicly-identified unauthorized routes that are currently being used. These routes, primarily created by the public, access dispersed recreation sites or connect NFTS roads. Since the Forest is currently open to cross-country travel, these unauthorized routes have been legally open to all vehicle classes for decades.

A review and screening of the inventoried routes was conducted for potential resource impacts, along with the suitability for addition to the NFTS as a maintenance level 2 road or a motorized trail. This screening process resulted in the unauthorized route additions proposed in the various alternatives. None of the proposed additions to the NFTS as roads pose a public safety concern. These routes are short, located on flat to mild slopes, generally do not have stream crossings, culverts, ditches, rolling dips or other features requiring maintenance for safety or resource mitigation. They have been used for decades with the only maintenance being conducted by users through handwork to remove debris blocking access. If added to the NFTS, these routes would continue under this maintenance approach, with the only change being minimal signing and danger tree abatement.

2. Miles of Motorized Mixed Use with Safety Concerns

The CVC allows the operation of non-highway-legal vehicles operated by unlicensed drivers on fire trails, logging roads, service roads regardless of surface composition, or other roughly graded trails and roads upon which vehicular travel by the public is permitted. The ORS allows the operation of non-highway legal vehicles on dirt or gravel roads if operated by permitted drivers. ML 2 roads are generally roughly graded and are only maintained for high-clearance vehicles. Operation of non-highway-legal vehicles on these roads is currently authorized by the Forest Service and is considered to be consistent with California and Oregon State law. Oregon law furthers extends this provision to ML 3 roads, subject to Forest Service approval. During public workshops held throughout Siskiyou County, it became apparent that many OHV users were not aware of the difference between ML 2 and ML 3 roads, and the associated vehicle restrictions. Their frame of reference is focused on the road surface - whether the road is paved or gravel/dirt. OHV users generally agreed that paved roads were not open to OHVs but were unaware of the difference between unpaved ML 3 and ML 2 roads. It is clear that some OHV use has occurred on ML 3 roads, not because it was sanctioned by the Forest Service but due to public misperception and historical practices on a large remote road system. An important aspect of implementing any alternative will be educating the public on where use of non-highway legal vehicles is allowed.

On roads considered highways, the CVC allows for non-highway legal vehicle operation if approved for “combined use” under Div 16.5, Sec 38026. The Forest Service considers NFTS

roads maintained for passenger cars to be highways under the CVC, and operation of non-highway legal vehicles on these routes requires analysis to determine if "mixed use" (the Forest Service term) is appropriate. Any decision about motorized mixed use on ML 3 and NFTS roads must be informed by a Motorized Mixed Use Analysis (MMUA) conducted by a qualified engineer. The analysis identifies risks associated with each road proposed for mixed use. The analysis may include mitigation measures that would reduce the risk associated with designating the road for motorized mixed use. A MMUA has been completed for this project and is included in the project files.

The MMUA for this project followed the Pacific Southwest Region guidance cited above. This guidance requires that ML 3 or roads proposed for MMU be reviewed to determine if reclassification to ML 2 is appropriate. It was determined that 130 miles of the 272 miles of passenger car (ML 3) roads that were proposed for mixed use among the alternatives are actually suitable for management as ML 2 roads. The road management objectives for these roads no longer support ML 3 status because 1) Forest traffic has shifted away from high traffic volumes associated with commodity extraction, and 2) these roads do not access communities, developed recreation sites or other sites that concentrate use. The results of the MMUA on these roads support reassigning them to ML 2. Table TM-5 and Appendix C provide details of the MMUA.

The remaining 142 miles in the action alternatives (37 ML 3 roads and two ML 4 roads) were evaluated in the MMUA; the probability and severity of a crash were determined to be low to moderate in all cases, so all were considered to be eligible for mixed use. Mitigations to enhance safety on the routes proposed for mixed use are listed in Chapter 2 of this FEIS.

There are several NFTS ML 2 roads that access private lands that are currently open to non-highway legal vehicles. These routes are proposed to change from open to all vehicles to open for use by highway legal vehicles only in the proposed action and several action alternatives. This proposal responds to a concern voiced by local landowners regarding dust, noise and property damage resulting from unmanaged OHV use on NFS lands adjacent to their property.

Safety issues related to the potential for asbestos dust are addressed in the Geology and Air sections of this chapter.

Indicators of Affordability

3. Annual Maintenance Costs

Maintenance costs are those required to keep the road in passable condition and to meet safety and resource concerns. Based on RMOs, every road does not need or receive maintenance every year to meet forest management goals, nor is every type of maintenance task completed when a road is maintained. There is no expectation, either by KNF managers or the public, that every mile of every KNF road will be passable every year. This holds true for unauthorized routes

proposed for addition to the NFTS. These routes will be added as ML 2 roads or motorized trails. Maintenance costs on the routes added as ML 2 roads will be minimal due to their physical attributes, single-purpose road management objectives (RMOs) for access to dispersed recreation sites, lack of resource impacts over a sustained period, and history of user participation to remove downed vegetation, rocks, etc. The total annual maintenance cost for the roads to be added to the system is estimated at $50 to $250 per mile. The $50 per mile cost is the minimum, what is likely to be needed; only monitoring and sign maintenance are anticipated. This estimate is considered to be likely due to the results of the screening efforts and road attributes discussed in measurement indicator 1. The $250 per mile (maximum) is the average cost of annual maintenance of ML 2 roads on the KNF, most of which have multi-purpose RMOs. Both numbers are used in tables to display the likely cost and maximum cost of implementing each action alternative.

The KNF does not have experience with maintaining motorized trails other than over-snow trails. An estimate of annual maintenance costs for motorized trails was determined using an estimate provided by a unit of the National Forest System that currently maintains motorized trails; this figure of $1000 per mile was inflated by 25% to account for lack of information on costs of local equipment to accomplish annual maintenance.

4. Implementation Costs

Adding routes to the NFTS will have direct effects in the form of initial costs. Actions associated with adding unauthorized routes as ML 2 roads or motorized trails includes initial sign construction and installation, and gathering and entering physical route data into the INFRA corporate database; this is estimated to cost $450 per mile. No reconstruction or major maintenance is anticipated for added roads, and no new construction is proposed.

Most of the proposed motorized trails will require mitigation to meet trail management standards based on trail management objectives (at a minimum, surface blading and drainage work such as water bars or rolling dips), estimated at $4500 per mile in the Humbug drainage (see Soils and Recreation sections of this chapter for additional information on mitigation in this area). Accomplishing the signing and data collection work for motorized trails is estimated to cost $150 per mile for a motorized trail.

The only additional cost for ML 3 motorized mixed use roads will be the installation of “Share-the-Road” signs (brushing for sight distance is already a requirement on ML 3 -5 roads). Initial motorized mixed use signing on ML 3 roads will cost approximately $100 per sign.

Methodology by Action

1. Direct and indirect effects of the prohibition of cross-country motor vehicle travel

Short-term timeframe: 1 year.

Long-term timeframe: 20 years.

Spatial boundary: The KNF boundary.

Methodology: GIS analysis.

Attempting to quantify where cross-country motorized travel would occur under the no action alternative (Alternative 1) is speculative, since it is impossible to predict exactly where, when, or how cross-country motorized use would occur. For consistency in comparing alternatives, the inventoried unauthorized OHV routes were used as a proxy for the area potentially affected by cross-country motorized use and to provide a baseline for safety considerations.

2. **Direct and indirect effects of adding facilities to the NFTS**

Short-term timeframe: 1 year.

Long-term timeframe: 20 years.

Spatial boundary: The KNF boundary.

Methodology: GIS analysis.

3. Direct and indirect effects of changes to the existing NFTS

Short-term timeframe: 1 year.

Long-term timeframe: 20 years.

Spatial boundary: The KNF boundary.

Methodology: GIS analysis.

4. Cumulative Effects

Short-term timeframe: Not applicable; cumulative effects analysis will be done only for the long-term time frame.

Long-term timeframe: 20 years.

Spatial boundary: The KNF boundary.

Methodology: GIS analysis.

Affected Environment

A majority of KNF visitors travel on NFTS roads; KNF roads are also an integral part of the transportation system for Siskiyou County. They provide access for income-producing activities such as grazing, timber harvest, mining and forest product gathering and for KNF program work such as fish and wildlife habitat management, fire protection, research, and insect and disease control. They also provide access to private parcels located within National Forest boundaries.

The existing NFTS on the KNF developed over the last century, first as a trail system for miners and trappers. As four-wheeled modes of travel became available, trails were expanded to accommodate larger vehicles and became wagon roads. The first roads through the KNF provided wagon access to Happy Camp along the Klamath River, Forks of the Salmon and Cecilville on the Salmon River, and the Haight Mountain area on the east side of the KNF. As the need for transportation efficiency grew and motor vehicles came into use, these routes were reconstructed to higher standards. The road system was greatly expanded in the 1950s and 1960s to accommodate timber harvest activities, and to provide access to industrial timber lands located within the Forest boundaries. These logging roads also provided access for recreational activities, opening up the Forest for a variety of pursuits, and making driving for pleasure one of the current most-cited uses of the Forest by recreation visitors.

Roads in the NFTS are not public roads in the same sense as roads that are under the jurisdiction of State and county road agencies. National Forest System (NFS) roads are not intended to meet the transportation needs of the public at large. Instead, they are managed only for the use and administration of NFS lands. Although generally open and available for public use, that use is at the discretion of the Secretary of Agriculture. Through authorities delegated by the Secretary, the Forest Service may restrict or control traffic to meet specific management direction (Forest Service Manual 7731).The current road system within the Klamath National Forest evolved to consist of nearly 10,000 miles of State, County, Forest Service and private roads, including:

- County and other local roads in and adjacent to the KNF – 4,000 miles
- KNF NFTS – 4,536 miles
- State Highways through and leading to the KNF – approximately 300 miles.
- Inventoried unauthorized routes - approximately 497 miles.

The Forest grooms 48 miles of snowmobile trails on the Goosenest Ranger District; 32 miles of these trails are on NFTS roads. This work is accomplished through use of California Green Sticker funds. The season of use for those roads (for other than over-snow vehicles) is May 1 – December 25. This season of use separates the two kinds of motorized use.

NFTS roads are managed in one of three ways: closed long term to motor vehicles (ML 1 - closed roads), roads maintained for high-clearance vehicles (ML 2), and roads maintained for low clearance (passenger car) vehicles (ML 3, 4, and 5). Existing NFTS trails are managed for non-motorized user type; the only trails available for motorized use on the KNF are for over-snow vehicles.

Table TM-1. Existing Klamath NFTS roads by operational maintenance level

Operational Maintenance Level	Miles
1 - Basic Custodial Care (Closed)	826.5
2 - High Clearance Vehicles (native surface)	2760.9
3 - Suitable for Passenger Cars (gravel or native surface)	805.1
4 - Moderate Degree of User Comfort (paved or chipsealed)	102.6
5 - High Degree of User Comfort (paved)	41.5
Total Miles	**4536.6**

The majority of the existing roads on the KNF were constructed for timber harvest and log haul. The ML 3 roads are fairly wide, have reasonable stopping sight distances and intervisible turnouts, and were originally surfaced with crushed aggregate. Maintenance level 2 roads were constructed to access timber stands and were designed for logging and administrative traffic only; they are generally narrower than ML 3 roads with steeper grades and tighter curves. Some originally had aggregate surfacing. Such surfacing longer needed for heavy log haul or resource protection; in most cases the original aggregate has worn down to where it is impractical, both physically and financially, to maintain the surface in a smooth condition for user comfort. The road surfaces are generally hard, stable and erosion resistant; however travel speeds are generally slow, between 10 and 25 miles per hour. Recent estimates of average daily traffic volume on the majority of NFTS roads range anywhere from less than 1 to around 15 vehicles per day. (At the higher rate, 15 vehicles over a 12 hour period generate a statistical average of one vehicle every 1.25 hours). A review of records for the past 15 years reveals no instances of highway/non-highway legal vehicle crashes on KNF roads. Site-specific information regarding road conditions, historical uses and safety for proposed mixed use routes is included in the Engineering Analysis of Motorized Mixed Use contained in Appendix C.

Maintenance of NFTS roads is funded from one of five sources:

- Annual appropriations – for road operation and maintenance using a national distribution formula based on several factors such as roaded land area, timber and fuels reduction targets and recreation use.

- Special appropriations and grants – competitive funds based on resource benefits, typically at the watershed level.
- Cooperators – Cooperators are private timber companies that have entered into a cost share agreement with the Forest Service to share the construction and maintenance costs of roads used by both parties. The maintenance of co-op roads is performed by both parties and coordinated at the annual co-op maintenance meeting every spring.
- Timber sale purchasers - purchasers perform maintenance on the roads they use to remove the timber from sales.
- Special use permittees, private landowners, and road use permit holders - As part of their permit, they contribute funds and/or perform maintenance on the roads they use commensurate with their level of use.

Cooperators maintain around 100-200 miles of road per year. Maintenance is primarily on ML2 and ML3 roads. Miles of road maintained by timber purchasers have varied widely in recent years due to economic fluctuations in the timber market and resultant effects on the Forest's timber sale program. Generally, purchasers maintain approximately 25-50 miles of road per year.

The annual maintenance costs for the current road system are estimated at $3 million; estimated maintenance costs for each alternative are included by alternative in the environmental consequences section. Forest-wide average costs per mile to maintain each operational maintenance level (ML) were developed and applied to the road system to calculate the estimated total cost. The average costs per mile are shown in 2. The average costs per mile were derived from local unit costs for maintenance items and frequency of maintenance appropriate for each operational maintenance level. The KNF does not have any designated trails for motorized vehicles other than over-snow vehicles.

Table TM-2. Annual maintenance cost per mile by operational maintenance level

Operational Maintenance Level	Annual Maintenance Cost $/Mile
1	$30/mile
2	$250/mile
3	$700/mile
4	$7,000/mile
5	$25,000/mile

Table TM-3 shows the past four years of maintenance accomplished by the KNF (excludes miles of road receiving maintenance by the Six Rivers National Forest).

Table TM-3. Miles of system roads and miles receiving maintenance (excluding those on the Ukonom Ranger District, managed by the Six Rivers NF), FY 2005 thru 2008

Operational Maintenance Level	Miles Receiving Maintenance FY2005	Miles Receiving Maintenance FY2006	Miles Receiving Maintenance FY2007	Miles Receiving Maintenance FY2008
Level 1	21.90	12.74	72.3	40.97
Level 2	478.14	367.11	824.3	686.03
Level 3	681.54	479.66	824.1	677.28
Level 4	45.95	40.64	75.1	60.2
Level 5	19.50	11.40	41.0	33.2
Totals	**1,247.03**	**911.55**	**1836.8**	**1497.68**

The KNF has developed a series of strategies, including an active storm-proofing and decommissioning program, to address the deferred maintenance backlog (summarized in Appendix C). The KNF has a good history of securing grant and partnership funds to decommission and storm-proof roads, thereby eliminating or reducing deferred and annual maintenance needs. Although the maintenance backlog costs seem high (approximately $20 million), these strategies are helping reduce the backlog over time. Appendix C includes a description of the variety of activities included in the road maintenance strategy to reduce backlog and associated costs.

The LRMP does not prohibit motor vehicle use over much of the Klamath National Forest. Approximately 1.2 million acres of the Forest are open for cross-country travel. Due to slope, topography and dense vegetation, not all acres are actually available for use by safety-minded motor vehicle operators. There are three large areas on the Goosenest District that have been seasonally closed to off-road travel for many years through Forest Orders. Four other smaller areas (one on the Goosenest District, two on the Oak Knoll District, and one on the Scott River District) are closed to off-road travel year-round by Forest Orders to protect sensitive resources. These Forest Orders will be superseded by a decision to implement an action alternative under this process.

Environmental Consequences

Alternative 1

Direct and indirect effects of the prohibition of cross-country motorized vehicle travel

Under this alternative, cross-country motorized vehicle travel is allowed on 1.2 million acres of the KNF. About 497 miles of unauthorized routes would continue to be used. There would be no effects on either safety or affordability of the NFTS in the short or long term. Exposure to potential safety hazards, such as rocks or overhanging tree limbs, and potential resource remediation costs will continue on the existing unauthorized routes and routes created in the future. Due to the low volume of traffic on these routes and the absence of a history of safety-related incidents, effects are expected to be minimal.

Direct and indirect effects of adding facilities to the NFTS

No additions to the existing NFTS would be made under this alternative. There are no effects on either safety or affordability of the NFTS.

Direct and indirect effects of changes to the existing NFTS

No changes to the existing NFTS would be made under this alternative. There are no effects on either safety or affordability of the NFTS.

Cumulative effects

Of the ongoing and reasonably foreseeable future actions listed in Appendix B, only road-related actions are likely to add to the effects of this project on transportation costs. The annual maintenance costs for ML 2 roads will decrease by $1,200 (minimum) to $6,000 (maximum) due to removal of 50 miles from the NFTS and addition of 26 miles by ongoing and reasonably foreseeable road actions. The 13 miles of ML 1 roads added by ongoing and reasonably foreseeable road actions will be in custodial status and only require closure monitoring (costing $390/year) for a total savings of $810 (minimum) to $5,610 (maximum) per year in annual maintenance costs.

Alternative 2

Direct and indirect effects of the prohibition of cross-country motorized vehicle travel

The prohibition of cross-country travel will remove motorized vehicle use from 405 miles of existing inventoried unauthorized routes and protect OHV users from exposure to potential safety hazards on 1.2 million acres. The potential for new unauthorized routes being created with safety hazards will be eliminated.

Direct and indirect effects of adding facilities to the NFTS

The 92 miles of unauthorized routes added to the NFTS in this alternative have been evaluated for safety and affordability. No safety hazards were identified. Implementation activities and costs associated with converting unauthorized routes to operational ML 2 roads are addressed in the discussion for Indicator 4; a maximum implementation cost of $35,100 for 78 miles of additional NFTS roads is estimated for this alternative (based on $450 per mile). Mitigation activities associated with addition of unauthorized routes as 14 miles of motorized trails are estimated to cost $63,000 (based on $4500 per mile). Total estimated implementation costs are displayed in Table TM-4.

Adding 78 miles of ML 2 road to the NFTS will minimally add to the Forest's road maintenance costs over time. These routes have rough native surfacing, and most need little active maintenance. Many of the routes to dispersed recreation sites are short and require very low vehicle speeds. Annual maintenance costs are expected to be $3,900 per year with a maximum of $19,500 per year if the maximum cost estimate is applied (Table TM-4). Annual maintenance costs of $1,250 per mile for 14 miles of motorized trails would equal $17,500; this work is expected to be funded out of recreation funds and state grants.

Direct and indirect effects of changes to the existing NFTS

Based on the MMUA, adding motorized mixed use to 119 miles of NFTS roads with the suggested mitigations will not adversely affect the safety of Forest users and will add minimal cost for signing of these roads.

Cumulative Effects

The proposed changes to the NFTS have reasonable implementation costs and were selected because they respond to public desire for certain motorized travel routes that would otherwise be eliminated, while not increasing safety risks or adding substantial costs to maintain the current NFTS. Ongoing and reasonably foreseeable actions will add 26 miles of road to the NFTS, primarily on the east side of the KNF (Goosenest Ranger District); 50 miles of road will be removed from the NFTS on the west side of the KNF, 48 miles of road by decommissioning and 2 miles by conversion to a non-motorized trail. The 13 miles of ML 1 road added to the NFTS will not have much effect on motorized vehicle travel or maintenance costs as they will be closed to public motorized vehicle use. The annual maintenance costs for ML 2 roads will decrease by $1,200 (minimum) to $6,000 (maximum). ML 1 roads are in custodial status and only require closure monitoring for a total of $390/year. The effects of these road actions added to the effects of this alternative would decrease annual maintenance costs by $810 (minimum) to $5,610 (maximum) per year for a cumulative maintenance cost for roads and trails from $20,590 (minimum) to $31,390 (maximum) per year for this alternative.

Alternative 3

Direct and indirect effects of the prohibition of cross-country motorized vehicle travel

The prohibition of cross-country motorized travel will remove motorized vehicle use from 497 miles of existing unauthorized routes and protect OHV users from exposure to potential hazards on 1.2 million acres of open lands. The potential for new unauthorized routes being created with safety hazards would be eliminated.

Direct and indirect effects of adding facilities to the NFTS

This alternative does not add facilities to the NFTS. There are no impacts on cost or safety under this alternative unless motorized vehicle use concentration on existing NFTS roads leads to accidents.

Direct and indirect effects of changes to the NFTS

This alternative does not make changes to the existing NFTS. There are no effects on cost or safety under this alternative.

Cumulative effects

Ongoing and reasonably foreseeable actions will add 26 miles of open road to the NFTS, 25 miles on the east side of the KNF (Goosenest Ranger District) and 1 mile on the west side. A total of 50 miles of road will be removed from the NFTS on the west side of the KNF, 48 miles by road decommissioning and 2 miles by conversion to a non-motorized trail for a saved annual maintenance cost of $1,200 (minimum) to $6,000 (maximum). The 13 miles of ML 1 road added to the NFTS will cost an additional $390/year as they will be closed to public motorized vehicle use. The effects of these road actions would reduce maintenance costs by $810 (minimum) to $5,610 (maximum) per year.

Alternative 4

Direct and indirect effects of the prohibition of cross-country motorized vehicle travel

The prohibition of cross-country motorized travel will remove motorized vehicle use from 490 miles of existing unauthorized routes and protect OHV users from exposure to potential hazards on 1.2 million acres of open lands. The prohibition would reduce exposure to unmitigated hazards on routes not proposed in any alternatives. The potential for new unauthorized routes being created with safety hazards or resource remediation costs would be eliminated.

Direct and indirect effects of adding facilities to the NFTS

The 7 miles of unauthorized routes added to the NFTS in this alternative have been evaluated for safety and affordability. No added safety hazards were identified. Implementation activities and costs associated with converting unauthorized routes to operational ML 2 roads are addressed in the discussion for Indicator 4; a maximum implementation cost of $2,700 for 6 miles of additional NFTS roads is estimated for this alternative (based on $450 per mile). Mitigation activities associated with addition of less than1 mile of unauthorized route as motorized trails are estimated to cost a maximum of $4,500 (based on $4500 per mile). Signing for added trails is estimated to cost $150 per mile. Total estimated implementation costs are displayed in Table TM-4.

Adding 6 miles of ML 2 road to the NFTS will minimally add to the Forest's road maintenance costs over time. These routes have rough native surfacing, and most need little active maintenance. Many of the routes to dispersed recreation sites are short and require very low vehicle speeds. Annual maintenance costs are likely to be $300 per year with a maximum of $1,500 per year using the maximum cost estimate (Table TM-4). Annual maintenance costs of $1,250 per mile for less than 1 mile of motorized trails would be a maximum of $1,250.

Direct and indirect effects of changes to the existing NFTS

Based on the MMUA, adding motorized mixed use to 119 miles of NFTS roads with the suggested mitigations will not adversely affect the safety of Forest users and will add minimal cost for signing of these roads.

Cumulative Effects

The proposed changes to the NFTS have reasonable implementation costs and were selected because they respond to public desire for certain motorized travel routes that would otherwise be eliminated, while not increasing safety risks or adding substantial costs to maintain the current NFTS. Ongoing and reasonably foreseeable actions will add 26 miles of open road to the NFTS, 25 miles on the east side of the KNF (Goosenest Ranger District) and 1 mile on the west side. A total of 50 miles of road will be removed from the NFTS on the west side of the KNF, 48 miles by road decommissioning and 2 miles by conversion to a non-motorized trail. The 13 miles of ML 1 road added to the NFTS will not have much effect on motorized vehicle travel or maintenance costs as they will be closed to public motorized vehicle use. The annual maintenance costs for ML 2 roads will decrease by $1,200 (minimum) to $6,000 (maximum). ML 1 roads are in custodial status and only require closure monitoring for a total of $390/year. The effects of these road actions added to the effects of this alternative would decrease annual maintenance costs by $810 (minimum) to $5,610 (maximum) per year for a cumulative maintenance cost

savings for roads and trails from $740 (minimum) to $2,860 (maximum) per year for this alternative.

Alternative 5

Direct and indirect effects of the prohibition of cross-country motorized vehicle travel

The prohibition of cross-country motorized travel will remove motorized vehicle use from 428 miles of existing publicly-identified routes and protect OHV users from exposure to potential hazards on 1.2 million acres of open lands. The prohibition would reduce exposure to unmitigated hazards on routes not proposed for addition to the NFTS in this alternative. The potential for new unauthorized routes being created with safety hazards would be eliminated.

Direct and indirect effects of adding facilities to the NFTS

The 69 miles of unauthorized routes added to the NFTS in this alternative have been evaluated for safety and affordability. No added safety hazards were identified. Implementation activities and costs associated with converting unauthorized routes to operational ML 2 roads are addressed in the discussion for Indicator 4; a maximum implementation cost of $21,150 for 47 miles of additional NFTS roads is estimated for this alternative (based on $450 per mile). Mitigation activities associated with addition of unauthorized routes as 22 miles of motorized trails are estimated to cost $99,000 (based on $4500 per mile). Signing for added trails is estimated to cost $150 per mile. Total estimated implementation costs are displayed in Table TM-4.

Adding 47 miles of ML 2 road to the NFTS will minimally add to the Forest's road maintenance costs over time. These routes have rough native surfacing, and most need little active maintenance. Many of the routes to dispersed recreation sites are short and require very low vehicle speeds. Annual maintenance costs are likely to be $2,350 per year with a maximum of $11,750 per year if the maximum cost estimate is used (Table TM-4). Annual maintenance costs of $1,250 per mile for 22 miles of motorized trails would equal $27,500.

Direct and indirect effects of changes to the existing NFTS

Based on the MMUA, adding motorized mixed use to 272 miles of NFTS roads with the suggested mitigations will not adversely affect the safety of Forest users and will add minimal cost for signing of these roads.

Cumulative Effects

The proposed changes to the NFTS have reasonable implementation costs and were selected because they respond to public desire for certain motorized travel routes that would otherwise be eliminated, while not increasing safety risks or adding substantial costs to maintain the current NFTS. Ongoing and reasonably foreseeable actions will add 26 miles of road to the NFTS, 25

miles on the east side of the KNF (Goosenest Ranger District) and 1 mile on the west side. A total of 50 miles of road will be removed from the NFTS on the west side of the KNF, 48 miles by road decommissioning and 2 miles by conversion to a non-motorized trail. The 13 miles of ML 1 road added to the NFTS will not have much effect on motorized vehicle travel or maintenance costs as they will be closed to public motorized vehicle use. The annual maintenance costs for ML 2 roads will decrease by $1,200 (minimum) to $6,000 (maximum). ML 1 roads are in custodial status and only require closure monitoring for a total of $390/year. The effects of these road actions added to the effects of this alternative would decrease annual maintenance costs by $810 (minimum) to $5,610 (maximum) per year for a cumulative maintenance cost for roads and trails from $29,040 (minimum) to $33,640 per year (maximum).

Alternative 6

Direct and indirect effects of the prohibition of cross-country motorized vehicle travel

The prohibition of cross-country motorized travel will remove motorized vehicle use from 438 miles of existing publicly-identified routes and protect OHV users from exposure to potential hazards on 1.2 million acres of open lands. The prohibition would reduce exposure to unmitigated hazards on routes not proposed for addition to the NFTS in this alternative. The potential for new unauthorized routes being created with safety hazards would be eliminated.

Direct and indirect effects of adding facilities to the NFTS

The 59 miles of unauthorized routes added to the NFTS in this alternative have been evaluated for safety and affordability. No added safety hazards were identified. Implementation activities and costs associated with converting unauthorized routes to operational ML 2 roads are addressed in the discussion for Indicator 4; a maximum implementation cost of $18,450 for 41 miles of additional NFTS roads is estimated for this alternative (based on $450 per mile). Mitigation activities associated with addition of unauthorized routes as 18 miles of motorized trails are estimated to cost $81,000 (based on $4500 per mile). Signing for added trails is estimated to cost $150 per mile. Total estimated implementation costs are displayed in Table TM-4.

Adding 41 miles of ML 2 road to the NFTS will minimally add to the Forest's road maintenance costs over time. These routes have rough native surfacing, and most need little active maintenance. Many of the routes to dispersed recreation sites are short and require very low vehicle speeds. Annual maintenance costs are likely to be $2,050 per year with a maximum of $10,250 per year if the maximum cost estimate is applied (Table TM-4). Annual maintenance costs of $1,250 per mile for 18 miles of motorized trails would equal $22,500.

Direct and indirect effects of changes to the existing NFTS

Based on the MMUA, adding motorized mixed use to 105 miles of NFTS roads with the suggested mitigations will not adversely affect the safety of Forest users and will add minimal cost for signing of these roads.

Cumulative Effects

The proposed changes to the NFTS have reasonable implementation costs and were selected because they respond to public desire for certain motorized travel routes that would otherwise be eliminated, while not increasing safety risks or adding substantial costs to maintain the current NFTS. Ongoing and reasonably foreseeable actions will add 26 miles of road to the NFTS, 25 miles on the east side of the KNF (Goosenest Ranger District) and 1 mile on the west side. A total of 50 miles of road will be removed from the NFTS on the west side of the KNF, 48 miles of road by decommissioning and 2 miles by conversion to a non-motorized trail. The 13 miles of ML 1 road added to the NFTS will not have much effect on motorized vehicle travel or maintenance costs as they will be closed to public motorized vehicle use. The annual maintenance costs for ML 2 roads will decrease by $1,200 (minimum) to $6,000 (maximum). ML 1 roads are in custodial status and only require closure monitoring for a total of $390/year. The effects of these road actions added to the effects of this alternative would decrease annual maintenance costs by $810 (minimum) to $5,610 (maximum) per year for a cumulative maintenance cost for roads and trails from$23,740 (minimum) to $27,140 (maximum).

Alternative 7

Direct and indirect effects of the prohibition of cross-country motorized vehicle travel

The prohibition of cross-country motorized travel will remove motorized vehicle use from 423 miles of existing publicly-identified routes and protect OHV users from exposure to potential hazards on 1.2 million acres of open lands. The prohibition would reduce exposure to unmitigated hazards on routes not proposed for addition to the NFTS in this alternative. The potential for new unauthorized routes being created with safety hazards would be eliminated.

Direct and indirect effects of adding facilities to the NFTS

The 74 miles of unauthorized routes added to the NFTS in this alternative have been evaluated for safety and affordability. No added safety hazards were identified. Implementation activities and costs associated with converting unauthorized routes to operational ML 2 roads are addressed in the discussion for Indicator 4; a maximum implementation cost of $23,850 for about 53 miles of additional NFTS roads is estimated for this alternative (based on $450 per mile). Mitigation activities associated with addition of unauthorized routes as 21 miles of motorized trails are

estimated to cost $94,500 (based on $4500 per mile). Signing for added trails is estimated to cost $150 per mile. Total estimated implementation costs are displayed in Table TM-4.

Adding 53 miles of ML 2 road to the NFTS will minimally add to the Forest's road maintenance costs over time. These routes have rough native surfacing, and most need little active maintenance. Many of the routes to dispersed recreation sites are short and require very low vehicle speeds. Annual maintenance costs are likely to be $2,650 with a maximum of $13,250 per year if the maximum cost estimate is applied (Table TM-4). Annual maintenance costs of $1,250 per mile for 21 miles of motorized trails would equal $26,250.

Direct and indirect effects of changes to the existing NFTS

Based on the MMUA, adding motorized mixed use to 262 miles of NFTS roads (ML 3, and ML 3 downgrades to ML 2) with the suggested mitigations will not adversely affect the safety of Forest users and will add minimal cost for signing of 131 miles of ML 3 roads. Alternative 7 would downgrade 130 miles of ML 3 road to ML 2; because ML 3 roads have an annual maintenance cost of $700 per mile, and ML 2 roads cost between $50 per mile (minimum) to $250 per mile (maximum) to maintain each year, cost savings from downgrading 130 miles of ML 3 road to ML 2 would save between $58,500 per year (maximum cost estimate for ML 2 roads) to $84,500 (minimum cost estimate for ML 2 roads) in annual maintenance costs.

Cumulative Effects

The proposed changes to the NFTS have reasonable implementation costs and were selected because they respond to public desire for certain motorized travel routes that would otherwise be eliminated, while not increasing safety risks or adding substantial costs to maintain the current NFTS. Ongoing and reasonably foreseeable actions will add 26 miles of road to the NFTS, 25 miles on the east side of the KNF (Goosenest Ranger District) and 1 mile on the west side. A total of 50 miles of road will be removed from the NFTS on the west side of the KNF, 48 miles of road by decommissioning and 2 miles by conversion to a non-motorized trail. The 13 miles of ML 1 road added to the NFTS will not have much effect on motorized vehicle travel or maintenance costs as they will be closed to public motorized vehicle use. The annual maintenance costs for ML 2 roads will decrease by $1,200 (minimum) to $6,000 (maximum). ML 1 roads are in custodial status and only require closure monitoring for a total of $390/year. The effects of these road actions added to the effects of this alternative would decrease annual maintenance costs by $810 (minimum) to $5,610 (maximum) per year for a cumulative maintenance cost for roads and trails from$28,090 (minimum) to $33,890 (maximum) per year. Cost savings due to converting 130 miles of ML3 road to ML2 would be $58,500 (maximum cost estimage) to $84,500 (minimum cost estimate) per year. The total estimated annual maintenance cost for this alternative would be a savings of at least $24,610 (using the maximum cost estimate) to $56,410 (using the minimum cost estimate).

Summary of Effects Across All Alternatives

The following tables summarize the effects analysis by comparing how each alternative responds to each measurement indicator.

Table TM-4. Estimated additional costs by alternative

Item/Cost Center	Alt 1	Alt 2	Alt 3	Alt 4	Alt 5	Alt 6	Alt 7
NFS Roads (miles added)	0	78	0	6	47	41	53
NFS Motorized Trails (miles added)	0	14	0	1	22	18	21
Indicator 3: Annual Maintenance ($)							
ROADS							
Roads from alternative alone (minimum cost)	0	3,900	0	300	2,350	2,050	2,650
Roads from alternative alone (maximum cost)	0	19,500	0	1,500	11,750	10,250	13,250
Roads including reasonably foreseeable actions (minimum cost)	-810	3,090	-810	-510	1,540	1,240	1,840
Roads including reasonably foreseeable actions (maximum cost)	-5,610	13,890	-5,610	-4,110	6,140	4,640	7,640
TRAILS	0	17,500	0	1,250	27,500	22,500	26,250
Total Annual Maintenance Cost (minimum cost) (maximum cost)[a]	-810 -5,610	20,590 31,390	-810 -5,610	-740 -2,860	29,040 33,640	23,740 27,140	28,090 33,890[7]
Indicator 4: Implementation Costs ($)							
Convert Route to High-clearance Road	0	35,100	0	2,700	21,150	18,450	23,850
Convert Route to Motorized Trail	0	2,100	0	150	3,300	2,700	3,150
Motorized Trail Mitigation Work	0	63,000	0	4,500	99,000	81,000	94,500
Total Implementation Cost	0	100,200	0	7,350	123,450	99,150	121,500

a - Includes reasonably foreseeable future road actions.
[7] Does not include savings due to conversion of ML 3 roads to ML 2.

Table TM-5. Proposed MMU by alternative

District	Road	Existing Op ML	Proposed Op ML	Miles					
				Alt 1/3	Alt 2	Alt 4	Alt 5	Alt 6	Alt 7
51	12	ML 3	ML 3	0	17.75	17.75	22.69	17.75	22.69
51	20	ML 3	ML 2	0	13.09	13.09	13.09	13.09	13.09
51	40S01	ML 3	ML 2	0	9.35	9.35	0	9.54	0
51	40S15	ML 3	ML 2	0	7.23	7.23	7.23	7.23	7.23
51	40S16	ML 3	ML 2	0	6.4	6.4	6.4	6.4	6.4
51	45N28	ML 3	ML 2	0	1.51	1.51	12	1.51	12
51	46N42	ML 3	ML 3	0	1.34	1.34	1.34	1.34	1.34
51	46N50	ML 3	ML 3	0	6.35	6.35	9.8	6.35	9.8
51	47N69	ML 3	ML 2	0	0	0	4.17	0	4.17
52	15N13	ML 3	ML 2	0	3.09	3.09	0	0	0
52	15N19	ML 3	ML 3	0	0	0	5.12	0	5.12
52	17N11	ML 3	ML 2	0	6.81	6.81	7.6	6.81	7.6
52	17N16	ML 3	ML 2	0	6.62	6.62	16.56	7.43	16.56
52	45N19	ML 3	ML 3	0	2.45	2.45	0	0	0
52	45N85	ML 3	ML 2	0	4.44	4.44	4.44	4.44	4.44
52	46N03	ML 3	ML 3	0	0	0	1.13	0	1.13
54	39	ML 3	ML 3	0	0	0	32.07	0	32.07
54	10N04	ML 3	ML 2	0	0	0	18.69	0	18.69
54	38N27	ML 3	ML 2	0	0	0	9.86	0	9.86
54	39N23	ML 3	ML 3	0	0	0	13.29	0	13.29
54	39N41	ML 3	ML 3	0	0.32	0.32	0.32	0.32	0.32
54	39N60	ML 3	ML 3	0	0	0	2.33	0	2.33
55	40N08	ML 3	ML 3	0	0	0	13.21	0	13.21
55	41N08	ML 4	ML 4	0	2.84	2.84	0	0	0
55	46N64	ML 3	ML 2	0	6.66	6.66	0	0	0
57	6	ML 3	ML 3	0	0	0	2.66	0	2.66
57	43N02	ML 3	ML 2	0	1.9	1.9	1.9	1.9	1.9
57	43N03	ML 3	ML 2	0	0.17	0.17	2.24	0.17	2.24
57	43N37	ML 3	ML 2	0	0.71	0.71	0.71	0.71	0.71
57	43N69	ML 3	ML 2	0	2.68	2.68	0	2.68	0
57	44N03	ML 3	ML 2	0	8.82	8.82	8.82	8.82	8.82
57	44N23	ML 3	ML 2	0	4.93	4.93	4.93	4.93	4.93
57	44N25	ML 3	ML 2	0	0.71	0.71	0.71	0.71	0.71
57	46N09	ML 3	ML 3	0	0	0	2.12	0	2.12
57	47N05	ML 3	ML 2	0	2.34	2.34	2.34	2.34	2.34
57	47N13	ML 3	ML 2	0	0.74	0.74	8.46	0.74	8.46
58	13N11	ML 3	ML 3	0	0	0	11.77	0	11.77
58	14N01	ML 4	ML 4	0	0	0	10.20	0	0
58	15N17	ML 3	ML 3	0	0	0	13.60	0	13.60
Total Miles ML 3 & ML 4 Proposed For MMU in Alternative Descriptions				0	119.25	119.25	271.80	105.21	261.60
Total Miles ML 3 Proposed For ML 2[a]				0	0	0	0	0	130.15
Total Miles ML 3 Proposed For MMU after Conversion of ML 3 Roads to ML 2[b]				0	0	0	0	0	131.45

a - Miles of ML3 roads considered suitable for management as ML2 roads per MMUA.
b - Actual miles of ML3 roads proposed for mixed use if ML3 roads are converted to ML2 per the MMUA.

Table TM-6. ML2 roads proposed for removal of non-highway vehicle use by alternative

District	Road	ML 2 Road Miles Proposed For Highway Legal Vehicles Only					
		Alts1 & 3	Alt 2	Alt 4	Alt 5	Alt 6	Alt 7
51	45N03X	0	0.5	0.5	0.5	0.5	0.5
51	45N29	0	1.41*	0	0	0	0
51	45N39	0	0.99	0.99	0.99	0.99	0.99
51	46N16	0	2.25	2.25	2.25	2.25	2.25
55	40N21	0	2.22	2.22	2.22	2.22	2.22
55	45N28	0	0.28	0.28	0.28	0.28	0.28
55	46N16A	0	1.2	1.2	1.2	1.2	1.2
57	43N30	0	0.54	0.54	0.54	0.54	0.54
Total Miles		**0**	**9.39**	**7.98**	**7.98**	**7.98**	**7.98**

Compliance with the LRMP and Other Direction

Alternative 1 implements the Klamath National Forest LRMP, which allows cross-country motorized travel on most land allocations, and the applicable standards and guidelines, but does not meet the requirements of the Travel Management Rule as it does not prohibit cross-country motorized vehicle travel.

The action alternatives meet all the applicable LRMP standards and guidelines. However, the LRMP, as written, is not in compliance with the Travel Management Rule. The action alternatives in this FEIS are designed specifically to implement the requirements of the Travel Management Rule (36 CFR 212, 251, 261 and 295) through an amendment to the LRMP that would prohibit motorized cross-country travel.

All roads analyzed for motorized mixed use were assessed for compliance with the California Vehicle Code, Oregon Revised Statutes and the Forest Service EM-7700-30 "Guidelines for Engineering Analysis of Motorized Mixed Use on National Forest System Roads." All ML 3 roads less than 3 miles in length have been reviewed by the California Highway Patrol; ML 3 roads exceeding 3 miles in length have been approved by the Regional Forester for mixed use (see Appendix C for the MMUA analysis).

* After publication of the NOI, it was determined that Road 45N29 is under the jurisdiction of Siskiyou County; therefore, it was removed from analysis in alternatives to the proposed action (Alternative 2).

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Society, Culture, and the Economy

Introduction

This section presents information on the social, cultural, and economic environments of communities that may be affected by the Klamath National Forest's (KNF) motorized travel management decision. The social and economic analysis area includes seven counties, 4 in California and 3 in Oregon. Communities possibly affected include Yreka, Weed, Happy Camp, Fort Jones, Etna, Dorris and Macdoel in California and Ashland, Medford and Klamath Falls in Oregon. The KNF serves as a primary recreation spot for local outdoor enthusiasts and a small number of visitors from outside the analysis area. Access to locations on the KNF influences participation rates in recreational activities. The greatest effect on the number of recreational visitors to the KNF, however, comes from the fact that most visitors are from the analysis area which has a relatively small population base.

Activities supported by the Forest affect economic and social conditions for local residents. For example, many local residents identify forest recreation and natural amenities with their quality of life. Therefore management of the KNF affects lifestyles, attitudes, beliefs and values. In addition to the social implications of forest management, visitors to the Forest have consequences for local economic conditions. Ultimately, expenditures related to use of the Forest can impact the type and number of jobs and level of income in the local economy.

Most of the KNF is located in Siskiyou County, California, which is extremely rural in nature in relation to most of California. Easily accessible by residents of the analysis area, the KNF serves as a venue for a variety of recreational opportunities. The Forest offers recreational activities for campers, hikers, wildlife watchers, hunters, fishermen, horseback riders, mountain bikers, white water enthusiasts, naturalists and other outdoor enthusiasts.

Both motorized and non-motorized activities are popular on the KNF. Motorized use on the Forest provides visitors with a means of getting to other locations for non-motorized activities, and serves as a recreational activity by itself. Both motorized and non-motorized activities attract visitors to the Forest, and those visitors have implications for economic and social conditions.

Analysis Framework: Statute, Regulation, LRMP, and Other Direction

Regulatory direction relevant and specific to the proposed action as it affects society, culture, and the economy includes:

The National Environmental Policy Act of 1969 (NEPA) sets forth policy on analysis and disclosure of the effects of proposed federal actions on the human environment, and consideration of the social and economics effects of actions in the disclosure.

The National Forest Management Act (NFMA) sets forth requirements for development of Forest Land and Resource Management Plans (LRMPs):

> The responsible official shall consider the effects of designated roads, trails and areas on the provision of recreational opportunities, access needs, and conflicts among uses of National Forest System lands. 36 CFR 212.55 (a)

> The responsible official shall consider effects on the following, with the objective of minimizing: Conflicts between motor vehicle use and existing or proposed recreational uses of National Forest System lands or neighboring federal lands; Conflicts among different classes of motor vehicle uses of National Forest System lands or neighboring federal lands; and the compatibility of motor vehicle uses with existing conditions in populated areas, taking into account sound, emissions, and other factors. 36 CFR 212.55 (b).

Klamath National Forest Land and Resource Management Plan (LRMP) includes program emphases and standards and guidelines for the social and economic environment and tribal government program. The following forest-wide standards and guidelines are relevant to travel management:

24-24 Provide for Native American needs for collection and/or use of traditional resources.
25-5 Seek interactions and involvement from potentially affected groups or individuals who will be, or may be, impacted by the implementation of a specific project.
27-1 Assist rural, forest dependent communities with efforts to enhance their economic stability and social vitality.

The monitoring and evaluation section of the LRMP emphasizes coordination and cooperation among federal agencies (including the KNF), local and state governments, tribes, and others.

Laws Pertaining to American Indian Tribes

Federal policy for tribes emphasizes self-determination and government-to-government relationships. The major laws that shape how the Federal Government supports tribal self-determination interests and government-to-government consultation are listed below. In addition, a long tradition of case law has defined reserved rights for American Indians, including water rights and trust responsibility of the Federal Government, among others (Getches et al. 1998). Laws relevant and specific to the proposed action as it affects Indian tribes include:

The National Environmental Policy Act of 1969 requires consideration of effects on cultural values and diversity.

The **American Indian Religious Freedom Act of 1978, as amended in 1994,** protects Indian religious practices and access to sacred sites.

Federal Land Policy and Management Act of 1976 requires federal agencies to coordinate with Indian tribes to inventory, plan, and manage resources of value to tribes.

National Historic Preservation Act of 1976 requires federal agencies to analyze and account for impacts of management on prehistoric and historic sites.

Archeological Resources Protection Act of 1979 (as amended in 1992) protects archeological resources and requires that affected tribes be notified if archeological studies might harm or destroy culturally or spiritually important sites.

American Indian Graves Protection and Repatriation Act of 1990 requires federal agencies to consult with tribes about disposition of American Indian remains, funerary objects, and other cultural relics.

Laws pertaining to the rights of federally recognized American Indian tribes acknowledge that these tribes have specific rights and interests, many unlike those accorded to other governments. An important distinction in U.S. law is that federally recognized American Indian tribes are not a special interest group; they are sovereign governments distinct from Federal and state governments. This legal standing confers government-to-government relations between the Federal Government and each federally recognized tribe. Powers that Federal laws do not expressly limit remain inherent powers of individual tribes. Reservations, rancherias, and Indian colonies all make up “Indian Country” as defined in the 1948 Indian Country Statute. American Indian governments have jurisdiction and authority over resources on Indian Country lands. On lands outside Indian Country, rights reserved for tribal governments may include rights to hunt and fish; rights to gather traditional plants, mushrooms, and lichens; and rights to water.

Effects Analysis Methodology

Assumptions Specific to the Society/Economic Analysis

- The change from an open to cross-country travel condition to a cross-country travel prohibited condition will reduce the availability of acreage for both motorized recreation and motorized access to KNF activities.
- The change from an open to cross-country travel condition to a cross-country travel prohibited condition will increase the availability of acreage for non-motorized recreation as well as non-motorized access to KNF activities.

- The National Visitor Use Monitoring (NVUM) report for the KNF accurately expresses, at a Forest scale, the most popular motorized and non-motorized activities for use in this analysis, as discussed in the Recreation section of this chapter.
- The area of influence (dust, noise) of motorized use on populated areas and private land is ½ mile from associated boundaries (e.g., private property line).
- There has never been any use analysis or traffic counts on the unauthorized routes; therefore, it would be highly speculative to make assumptions of use levels on these routes, as discussed in the Transportation section of this chapter.
- The majority of the motorized public use occurring on the KNF is occurring on the existing NFTS (based on observation and NVUM data, as discussed in the Recreation section of this chapter).
- Effects on safety are discussed in the Transportation section of this chapter and in Appendix C.
- Effects on human health from naturally occurring asbestos (NOA) are discussed in the Geology and Air sections of this chapter.
- Adding more routes to the NFTS will not generate additional motorized use across the Forest because (1) most use is on existing roads; (2) use will continue to be dispersed across the Forest; (3) most use is by local residents; (4) the population of Siskiyou County has remained relatively static for 20 years; and (5) there are not any data that indicate such an increase would occur.

Data Sources

- GIS data layers for routes and private land boundaries
- KNF NVUM report for most popular non-motorized and motorized recreation activities
- U.S. Census; U.S. Bureau of Labor Statistics, 2008; California Department of Labor; California Department of Finance; American Community Survey, 2006; Minnesota IMPLAN Group (MIG), 2006; Headwaters Economics, Economic Profile System (EPS) 2007; for population and economic statistics

Indicators

- Effects on social well-being: (1) miles of unauthorized routes proposed for addition to the NFTS; (2) acres of area available for motorized cross-country vehicle travel.
- Motorized access to dispersed recreation opportunities: number of routes to dispersed sites.

- Effects on private property owners: number of miles of unauthorized/proposed routes within ½ mile of private property

Methodology by Action

Methodology for Economic Impact Analysis

"Economic impact analyses seek to determine short-term effects that Forest Service programs have on economic conditions in defined impact areas in which the planning area occurs" (FSM 1900). As prescribed by FSM 1900, short-term effects are those that occur within the first 10 years.

Models of the local economy (analysis area) were built using IMPLAN Professional 2.0 software and 2006 data. A change in the activities allowable by the Forest could change the local economic stimulus (e.g. increased recreational visits) which could change the total of jobs and income in the area. For travel management, however, it is assumed that none of the actions proposed in any alternatives will have a predictable effect on the total number of recreational visits to the KNF. For example, prohibition of cross-country motorized travel could decrease the number of motorized visits to the KNF, or the same number of visitors could be redistributed across existing NFTS routes. Without a direct correlation between recreational opportunities offered or prohibited and visitor use to the KNF, it is not possible to use any economic model, including IMPLAN, to distinguish between the economic effects of different alternatives. Comparison of economic effects is not possible. Therefore, measurable economic impacts from the activities in each of the alternatives are not provided in this analysis.

The economic contributions of motorized recreation use for the 7-county analysis area are calculated for the existing situation. Specifics on how the number of recreational visits, the distribution among types of recreation used, and the proportions of local versus non-local visitors affect economic modeling are in a process paper in the records for this project, located at the KNF Supervisor's Office in Yreka, CA.

Methodology for Social Impact Analysis

The action alternatives would produce changes in the condition of the social environment, and the effects of these changes are more closely tied to recreational opportunities than are economic effects. Individuals are affected differently by actions, and increases in the social welfare of one group may be offset by decreases to another group. Quantitative measurement of net social welfare across alternatives is outside the scope of this analysis; the effects analysis reported here relies on a qualitative assessment of changes in social conditions stemming from the specifications of the action alternatives. Groups addressed are (1) those who engage in motorized recreation; (2) those who engage in "quiet" recreation; and (3) residents of private lands within ½

mile of the KNF who are disproportionately affected by the dust, noise, and physical presence of OHVs.

1. Direct and indirect effects of the prohibition of cross-country motor vehicle travel

Short-term timeframe: 1 to 10 years.

Long-term timeframe: 20 years.

Spatial boundary: The four northern California Counties (Del Norte, Humboldt, Siskiyou, Trinity) and three southern Oregon Counties (Klamath, Jackson and Josephine), with special emphasis on Siskiyou County which encompasses 98% of the KNF.

Methodology: GIS analysis.

Attempting to quantify where cross-country motorized travel would occur under the no action alternative (Alternative 1) is speculative, since it is impossible to predict exactly where, when, or how cross-country motorized use would occur. For consistency in comparing alternatives, the inventoried unauthorized OHV routes were used as a proxy for the area potentially affected by cross-country motorized use and to provide a baseline for disturbance.

2. Direct and indirect effects of adding facilities to the NFTS

Short-term timeframe: 1 to 10 years.

Long-term timeframe: 20 years.

Spatial boundary: The four northern California Counties (Del Norte, Humboldt, Siskiyou, Trinity) and three southern Oregon Counties (Klamath, Jackson and Josephine), with special emphasis on Siskiyou County.

Methodology: GIS analysis.

3. Direct and indirect effects of changes to the existing NFTS

Short-term timeframe: 1 to 10 years.

Long-term timeframe: 20 years.

Spatial boundary: The four northern California Counties (Del Norte, Humboldt, Siskiyou, Trinity) and three southern Oregon Counties (Klamath, Jackson and Josephine), with special emphasis on Siskiyou County.

Methodology: GIS analysis.

4. Cumulative Effects

Short-term timeframe: Not applicable; cumulative effects analysis will be done only for the long-term time frame.

Long-term timeframe: 20 years.

Spatial boundary: The four northern California Counties (Del Norte, Humboldt, Siskiyou, Trinity) and three southern Oregon Counties (Klamath, Jackson and Josephine), with special emphasis on Siskiyou County.

Methodology: GIS analysis.

Cumulative effects of this project involves analysis of effects from this project and other similar projects. Because the analysis focuses on road-related issues (values and economics related to availability of certain types of recreation and accessibility to private lands), the projects included in the cumulative effects analysis are the reasonably foreseeable activities related to access management – construction or decommissioning of roads.

Affected Environment

Population and Demographics

Population structure (size, composition, density, etc.) and dynamics (how the structure changes over time) are "essential to describing the effects and consequences of forest management and planning on a social environment" (Seesholtz, et al., 2004). Population increases may lead to conflicts over forest uses, travel management, recreation activities and values.

Individuals with different demographic and social backgrounds are likely to be affected differently by the KNF motorized travel management decision. Social and economic well being may affect their preference of, and demand for, recreational opportunities on the Forest. Forest visitors generate important economic stimulus for many businesses, which then impacts employment and income levels.

Current population levels influence the use of natural resources; forecasts of future population levels may help to indicate whether there may be the potential for increased pressures on KNF resources. Age distributions provide insights into the proportion of individuals in the working age group versus retirees and minors who typically have different use patterns and utilize local services in different ways. Similarly, the racial or ethnic composition of the population may affect cultural uses. Employment and income statistics describe the economic conditions of the analysis area, and help identify important sectors of the economy. Additionally, household income may affect participation levels in forest recreation.

In recent years, population size of the 7-county analysis area has remained relatively stable; most counties have experienced minimal population growth. Siskiyou County, from where more than 50% of the KNF recreation visitors come, has increased only 3% over the 8 years between 2000 and 2008. There have been no sharp increases or decreases in population to suggest substantial changes in the economic or social structure.

The median age in each of the 7 counties is higher than the median age for their respective states. This suggests that residents of the analysis area are older than residents in more metropolitan areas of California and Oregon. This could be due to the lack of job opportunities to draw and retain a younger population, or may be related to a greater number of retirees.

The vast majority of residents around the KNF are Caucasian. The counties have a very different ethnic composition from that of California as a whole. California's population is approximately 60% percent Caucasian; that of Siskiyou County is 87%, which is about average for the 7 surrounding counties. Nearly 36 percent of California's population is of Hispanic origin; Siskiyou County is only 8%. However, the Native American population has a much higher presence around the KNF than in California as a whole; Siskiyou County is 4% Native American while California is less than 1%.

Employment and Income Conditions

Employment and income have been relatively stable in the 7-county area until the recent recession of 2008-2009. Government and retail trade support the largest percentage of jobs, followed by health and social services, and other services. Travel management decisions as they pertain to recreation may affect the condition, and relative importance, of tourism-based sectors of the local economy. The government sector is the largest employer in all counties except for Jackson and Josephine. Retail trade, health and social services and construction are the dominant sectors in Jackson County. Agriculture, forestry, fishing and hunting are important employers in Siskiyou County, accounting for 7% of total employment respectively. Retail trade accounts for 11% and accommodation and foods services for 10% of employment. Motorized travel management on KNF may support jobs in these sectors. Businesses in the latter sectors likely generate economic stimulus from activities on the KNF due to travelers purchasing goods and services while on their way to visit the Forest.

Another indicator of economic health is the level of unemployment in the analysis area. All seven counties have consistently maintained an unemployment rate near or greater than the state average in recent years; Siskiyou County unemployment rate has averaged 2% to 4% higher than the state of California. With the higher unemployment rates in Siskiyou County, it is likely that any new demands for labor would be supplied from the local labor market rather than by workers coming in to the county. Any additional jobs created by activities on the KNF would likely not affect household migration patterns, and may serve to reduce unemployment rates.

Under the current situation, recreation use on the KNF generates a total of 217 jobs and $6,022,824 in labor income in the 7-county analysis area. Of that number, 67 jobs and $1,652,330 in labor income are supported by non-motorized activities, and 12 jobs and $299,025 in labor income are supported by motorized activities. Driving for pleasure supports the most economic activity among motorized recreation; 5 jobs and $130,262 in labor income by locals and 3.2 jobs and $77,499 in labor income by non-locals.

The majority of economic stimulus supported by recreation on the KNF is from "all other" activities (not categorized as non-motorized or motorized). Visitor use in these activities combined supports 139 jobs and $4,071,469 in labor income.

Visitor Use

According to NVUM, of the main reasons for visiting the Forest, 9.8 percent fall into the motorized category and 26.6 percent in non-motorized. Of the motorized activities, driving for pleasure was the most popular, accounting for 8.1 percent of main activities and 26.6 percent of total activity participation. Nationwide, participation in OHV activities has experienced an increasing trend in recent years (see Recreation section of this chapter). California is the highest ranked state amongst OHV users with 4.99 million participants or 11.6 percent of the U.S. total (Cordell et al, 2008). This increase is not reflected in the NVUM data for the KNF; OHV use continues to be low.

When assessing recreational use, it is important to distinguish between local and non-local visitors. As defined in NVUM surveying, non-local visitors are those who reside more than 30 straight line miles from the Forest boundary (Stynes and White, 2005). This distinction allows for spending related to the Forest visit to be differentiated between locals and non-locals. It is possible that local visitors would substitute other activities for recreation on the KNF, and would still make expenditures at local businesses and firms. Spending by non-local visitors (25 percent of total annual visits) to the Forest represents new money to the local economy.

Money spent by Forest visitors helps support jobs and income in the local economy. Non-locals staying the night off the Forest spend the most during their trip. Overall, 53 percent of total spending is by non-locals. Visitors make expenditures on a variety of different goods and services supporting recreational activities. Non-locals staying off the Forest spend the most among all market segments, due in large part to the additional expense of lodging at non-KNF facilities.

Lifestyles, Attitudes, Beliefs and Values

The KNF is in a very rural part of the Western United States. Thus, the lifestyles, attitudes, beliefs and values of local residents are likely to be different than those in more metropolitan areas. Many local residents depend on the environment to support both professional and personal interests; this in turn affects their lifestyle and attitudes towards the area.

Travel management and motorized recreation have been a topic of concern among KNF stakeholders for many years. The KNF NFTS currently includes more than 2,700 miles of roads that allow both highway legal and non-highway legal vehicles (mixed use). Authorized travel on the Forest affects the lives of individuals and groups in many ways. Many residents of the analysis area associate their attitudes, beliefs and values with outdoor recreational opportunities and natural amenities. The KNF LRMP identified quality of life as the most important social issue for local residents. It indicates that many people reside in the area because they value the available way-of-life, and changes to their lifestyle are of immense concern (USDA Forest Service, 1995). Four social groups were identified to have concerns for forest management: long-term residents, new rural residents, destination-recreation travelers and Native Americans. The motorized travel management plan is likely to have implications for each.

Access to the KNF is important to social groups for different reasons. New and old residents may utilize KNF resources for professional and personal reasons. For some, their employment status may depend on the removal of forest products; for others, recreational opportunities may affect how they spend their leisure time. For destination-recreation travelers, access to the Forest may affect their ability to participate in recreational activities and their demand for such activities. Furthermore, access to the KNF may affect the cultural and traditional activities experienced by Native Americans.

In Siskiyou County, small communities close or adjacent to the KNF would be affected more than those further away. Siskiyou County supports a largely rural way of life. “The Code of the West: the Realities of Rural Living” (Siskiyou County, 2005) sheds light on some of the conventions of living in Siskiyou County. “The right to be rural” is a fundamental theme among County residents. The rugged terrain of the KNF contributes to the isolation of many communities, and further promotes a rural lifestyle. Self-reliance, interdependence between neighbors, and close interaction with the outdoors are important benefits of living in Siskiyou County. This theme directly relates to the use of KNF resources. Many rural residents, through a lifetime of use, have been able to drive anywhere they want on NFS lands. This freedom to drive off-road is considered by some to be a right rather than a privilege subject to management. Although many residents do not actually drive cross-country, they like to know that the opportunity exists. For these individuals, this change could affect their perception of their relationship to the National Forest more than their actual use. The opportunity to drive cross-country will be lost under the required implementation of the Travel Management Rule.

Siskiyou County residents have a strong sense of tradition and culture. The Siskiyou County Comprehensive Land and Resource Management Plan states that “the people of Siskiyou County are unique products of the complex web of land and resource uses and practices; values and beliefs that nurture their communities, sustain their economies, empower their local government and give form and shape to their spiritual and physical environments” (Siskiyou County, 1996).

The KNF plays an important role in the values and beliefs developed upon traditional uses of the land and community stability. “Community stability entails an environment where people and their customs and cultures are left to their own democratic means.” (Siskiyou County, 1996) Implementation of the Travel Management Rule could affect such traditions and cultural values by limiting access to land to which residents have established connections over time. The goal of the County’s comprehensive land and resource planning is to ensure community stability is achieved through the empowerment of local customs and culture rather than national consensus (Siskiyou County, 1996). Thus, it is apparent that residents of Siskiyou County would be greatly concerned by any loss of access to public lands as a result of national policy. Under every alternative, the KNF would retain at least 2,700 miles of roads that are open to OHV use, and allow mixed use on roads where such use is safe and reasonable. This is consistent with the Siskiyou County Comprehensive Land and Resource Management Plan which promotes retention of access to federal lands for the benefit of county residents.

Assessments of the socioeconomic environment reveal many issues important to local residents (Doak and Kusel, 1997). Given the location of the Forest, residents of Siskiyou County would be the most affected by this motorized travel management plan. Many of them have close ties to the Forest, and genuine concerns regarding the implications of travel management planning on their personal lifestyles. The terms “custom, culture and tradition” are used locally; they refer to the types of activities and lifestyle that are generated by local residents, and passed on through generations of use. Many of those activities are affected by access to the Forest. One important issue is the ability to travel cross-county for dispersed camping. Many residents of Siskiyou County greatly value the ability to camp away from the noise and dust associated with more frequently traveled sites. This is particularly important on the Goosenest District, on the east side of the KNF, where more gentle terrain allows cross-country use. Local residents have used dispersed camping opportunities for generations; for many families, such activities have become a time-honored tradition. Restrictions in access which limit opportunities for dispersed camping could result in local residents becoming disconnected from the Forest over time. Maintaining those opportunities close to home is part of that tradition. Thus, they may not be likely to look for new areas to recreate because that would result in a loss of traditional values. Maintaining the ability to participate in dispersed camping, especially in traditionally-used sites, is of great importance to the customs and culture of many local residents.

Somewhat in contrast to the supporters of dispersed camping, there are also stakeholders concerned with the implications of motorized travel on ecosystems. A healthy environment also affects the lifestyles, attitudes, beliefs and values of local residents. Many non-motorized recreational activities are enhanced by less motorized travel; thus, these users-groups could potentially experience greater value with more restrictions in motorized use. There appears to be a tradeoff in the quality of recreation experienced by parties with different interests. As values

increase for one user group, it is possible for values to decrease for others. Finding a balance between all interested parties is a difficult task.

A variety of other issues have also emerged during public scoping. Big game retrieval is a concern expressed by a large segment of the hunting population. This is of particular importance to the elderly and those with physical handicaps with limited ability to walk long distances to retrieve downed game. Siskiyou County residents have been accustomed to using motor vehicles for big game retrieval on flatter terrain on most areas of the Forest, although cross-country travel has been seasonally prohibited on three large areas on the Goosenest District for the last 20 years. Under every alternative except for the no action, the opportunity to retrieve big game through cross-county travel would be forgone. This would be a substantial deviation from traditional hunting methods and may result in a greater disconnection between local residents and the Forest. Some hunters may choose to no longer hunt on KNF lands because of the idea that under certain circumstances they would be unable to drive to harvested animals.

Other issues that have emerged are unrelated to recreation. Examples of non-recreation stakeholders are those who gather forest products (e.g. firewood, mushrooms, posts & poles) as part of their lifestyle or for income, contractors involved in reforestation or other activities, and mining claimants. Permit holders and contractors have raised concerns regarding the need for cross country motorized travel in order to fully execute their permit or contract. Holders of special forest products permits (firewood, mushrooms, boughs, posts/poles, etc.) have requested authorization to drive cross country to find and harvest products. Grazing permit holders have areas where OHVs are used to check improvements or manage livestock. Contractors involved in reforestation or other activities have an interest in using ML 1 roads to access their planting sites. Mining claimants may need to develop access to their claims. Although the prohibition on cross country travel does not include exemptions for specific uses, the Travel Management Rule does allow exemptions for “motor vehicle use that is specifically authorized under a written authorization issued under Federal law or regulation.” Therefore, accommodation for these types of needs can be made through the permit, contract, or Plan of Operations, if appropriate. These decisions will be made at the program or project levels.

Generally, Siskiyou County residents enjoy outdoor recreation; for many it was a motivating factor in the decision to live there. Although it is possible that local visitors may substitute other local activities for those on the KNF, it is unlikely given customs, culture and traditions. With relatively low income and high unemployment, it is less likely that County residents would have the capacity to go somewhere else to recreate. Since the KNF represents most of the public land in Siskiyou County, it is not reasonable to expect that local residents can easily substitute cross-country motorized recreation on other lands, even if other national forests weren’t prohibiting it. Substitution is even less likely for those who have used cross-country motorized travel to gather wood or other Forest products as part of their lifestyle. Likewise, hunters are unlikely to abandon

their traditional hunting spots just so they can retrieve their big game by vehicle. There may be a certain degree of substitution that would occur under implementation of the Travel Management Rule; however, privately-owned, State or developed national forest campgrounds do not offer the quiet and seclusion that may be found at dispersed campsites on the KNF, and many of these substitutes require a fee while dispersed camping is free. Although cross-county travel is prohibited under all action alternatives, the KNF has addressed access to popular dispersed recreation sites through identification of motorized routes serving identified sites so that this opportunity will remain available to Forest users.

The relationship between the KNF and the lifestyles, attitudes, beliefs and values of its constituents has many components. Effects vary by communities of interest according to their uses of the Forest. Communities of interest bring together stakeholders with shared interests in the framing and resolution of a problem (Fischer, 2001). For example, the farming and ranching community has a shared concern for the grazing resource. How that resource is managed affects the social well-being of individuals in that community. The ability to travel cross-county is important to many grazing permit holders in order to maintain their operations. Agriculture has historically been an important component of northern California's and southern Oregon's social and economic environments. As the social dynamic of the area changes, so does the presence of communities of interest. The farming and ranching community will continue to be a prominent interest group in the political arena, but as communities evolve, they will continue to be joined by other interest groups with varying views of Forest management. Recreational and environmental interest groups are becoming increasingly involved in the Forest management process. Their lifestyles, attitudes, beliefs and values also depend on the use and management of resources. The Native American community will also continue to use forest resources for cultural and traditional reasons. Their way of life depends in part on forest management. With such a variety of communities of interest, the KNF influences lives in many ways. Balancing the interests of each group is an issue that must be taken into account during the motorized travel management process. Siskiyou County supports multiple uses of natural resources. Siskiyou County's strategic plan expresses the desire for county government to support and encourage diverse recreational activities on public lands, including both low impact (e.g. hiking, fishing and wildlife viewing) and higher impact (e.g. snowmobiling and OHV riding) activities (Siskiyou County, 2008). The County is also proactive in natural resource conservation, promoting forest health and fire prevention on both public and private lands. Input from the County was helpful in developing motorized travel management alternatives.

Private Lands Adjacent to the Klamath National Forest

Residents of private land adjacent to the KNF have special concerns about motorized travel management. Cross-country motorized travel increases the potential for dust and noise on neighboring private lands, and provides access to private property by users of non-highway legal

vehicle who may not realize that they have left NFS lands. For several years, landowners in the Hawkinsville area have reported OHV trespass on their lands. The OHVs access the KNF on several different NFTS and county roads, and then drive cross-country on both KNF and private lands. Beyond the noise and dust, residents report that livestock has been spooked and harassed, fences have been cut or torn down, and private property and facilities have been vandalized.

Federal Lands Adjacent to the Klamath National Forest

The KNF is surrounded by other National Forest System lands managed by the Modoc, Shasta-Trinity, Six Rivers, Rogue River/Siskiyou and Fremont/Winema National Forests. These national forests are also undergoing motorized travel management projects that will prohibit cross-country travel. Federal lands in the analysis area managed by Federal agencies other than the Forest Service are not immediately adjacent to the KNF. Effects of projects on these lands on the KNF, and the effect of the KNF project on them, are discussed in the Environmental Analysis portion of this section.

Environmental Justice

Per Executive Order 12898, all federal actions are required to consider the potential of disproportionate effects on minority and low-income populations in the local region. The principles of Environmental Justice require agencies to address the equity and fairness implications associated with federal land management actions.

According to the American Community Survey and US Census data, the Native American population in the analysis area meets the Environmental Justice criterion as a minority population that is substantially greater in percentage than its percentage of the population of California or Oregon. Therefore, the KNF must pay careful attention to the potential impacts of management actions on Native Americans.

In terms of low-income populations, in 2005 all counties except for Jackson County have poverty rates higher than that of their respective states. The poverty rate in Siskiyou County increased from 2000 to 2005, and has likely increased again during the recession of 2008-2009. A substantial proportion of the existing population is considered as a low income group, and decisions regarding future management actions on the Forest must carefully assess the effects on low income populations.

Civil Rights

USDA civil rights policy requires each agency to analyze the civil rights impact(s) of policies, actions, or decisions that will affect federally conducted and federally assisted programs and activities. A civil rights impact analysis (CRIA) facilitates the identification of the effects of eligibility criteria, methods of administration, or other agency-imposed requirements that may

adversely and disproportionately impact employees or program beneficiaries based on their membership in a protected group. Protected groups include multiples of similarly situated persons who may be distinguished by their common race, color, national origin, age, disability, and where applicable, sex, marital status, familial status, parental status, religion, sexual orientation, genetics, political beliefs, or receipt of income from any public assistance program.

Indian Tribes and the Klamath National Forest

There are four federally recognized tribes that regularly use the KNF: Karuk Tribe, Quartz Valley Indian Reservation, Klamath Tribes, and Pit River Tribes. There are also two tribes in the area that are not federally recognized: Shasta Tribe Inc., and the Shasta Nation.

American Indians living in or around the Klamath National Forest live throughout the analysis area and have a significant ongoing interest in the management of the Forest.

Contemporary American Indian uses of the Forest include cultural and spiritual events, fishing, hunting, food gathering, collection of medicinal plants, and the collection of basketry materials. Numerous sites on the KNF are used for traditional cultural activities (ceremonies, gathering, etc.). Depending on the site, access may be provided by existing routes or cross-country motorized travel.

Often, important places to local American Indians are those that supply native foods or provide a spiritual connection to the land. Harvesting of native foods is very important to local tribes. National Forest System Lands provide salmon, acorns, wild plums, berries, bulbs, and many other foods vital to traditional diets. Traditional food sources serve to regulate health conditions of many American Indians (Martinez, 2008). As American Indians have moved away from traditional foods, negative health effects have been encountered; diabetes is one chronic condition affecting many American Indians forced away from traditional foods (Martinez, 2008). Thus, the availability of Federal lands for food harvesting is an important issue to tribes in the areas in and adjacent to the KNF.

American Indians have a spiritual connection to the environment and native landscapes. Maintaining this type of relationship with the lands managed by the KNF is important to local tribes for passing along knowledge to future generations.

Restrictions on motor vehicle use that are applied consistently to everyone are not discriminatory. However, some groups could be impacted more than others. The public involvement process for this project (detailed in Chapter 1) and interdisciplinary discussions identified the following concerns:

Gathering of Special Forest Products

It is known that many people, including members of protected groups, use motor vehicles to gather special forest products including mushrooms, greenery, firewood, posts, poles, etc. Such products are gathered for both personal and commercial use. Some protected groups are known to be very active in gathering certain special forest products. Concerns have been raised that the prohibition on cross country travel will restrict such activities to designated roads or trails, and thereby limit people's ability to gather such products and disproportionately impact protected groups. For many years the Goosenest Ranger District has maintained three large road management areas prohibiting cross-county travel during six months of the year. People using those areas during the closure period (e.g. for mushroom picking) will not be affected by implementation of the Travel Management Rule.

Currently, under 36 CFR 261.6, removing any timber, tree or other forest product, except as authorized by a special-use authorization, timber sale contract, or Federal law or regulation is prohibited. While permitted activities may be exempted from the prohibition on cross-country motorized travel when provided in the permit (36 CFR 212.51 (8)), analysis of such exemptions is outside the scope of this document. Such activities have been, and will continue to be, subject to separate, site-specific National Environmental Policy Act analysis before permits are issued.

A prohibition on cross-country motorized travel may result in additional travel time for those who gather forest products, as they may be required to walk rather than drive to gathering sites. In addition, removal of large products (posts and poles) may be limited to sites adjacent to roads. Regardless of the product, all gatherers of forest products will be equally affected by the prohibition; no protected groups will be disproportionately affected.

Impacts on People with Disabilities and the Elderly

Throughout scoping, concerns have been raised about the impact of this travel proposal on people with disabilities and the elderly. Some people who commented asserted that the proposal unfairly discriminates against these groups because they are more dependent on motor vehicles to access and enjoy our National Forests. Comments primarily focused on access to dispersed camping sites and hunting locations, and access for woodcutting. Where possible, these comments were used to develop alternatives. Hunting and woodcutting sites are dispersed throughout the Forest; it is not possible to develop a route system that would fulfill every hunter's need. Woodcutting is a permitted activity and is addressed under special forest products. Dispersed camping opportunity was addressed through identification of currently used dispersed camping sites across the Forest. Many of these sites are used regularly, and some are traditional use sites for families or individuals. Motorized routes to these identified sites were included in several of the action alternatives. Motorized access to dispersed camping sites provides opportunities for the elderly and mobility-impaired individuals to enjoy camping away from heavily-used roads and trails. It

should be noted that the KNF NFTS contains more than 2,700 miles of roads that are open for use by off-highway vehicles. These roads provide access to a diversity of vegetative types and recreational opportunities, and will continue to be available regardless of the alternative selected for implementation.

Implementation of the Travel Management Rule, Subpart B, including the prohibition of cross- country motorized travel, is forest-wide and applies to all forest users equally. Changes to the NFTS are largely limited to changes in vehicle class. There is no legal requirement to allow people with disabilities to use motor vehicles on routes and in areas that are closed to motor vehicle use. Restrictions on motor vehicle use that are applied consistently to everyone are not discriminatory. Generally, granting an exemption from designations for people with disabilities would not be consistent with the resource protection and other management objectives of travel management and would fundamentally alter the nature of the Forest Service's travel management program (29 U.S.C. 794; 7 CFR 15e.103).

Under section 504 of the Rehabilitation Act of 1973, no person with a disability can be denied participation in a Federal program that is available to all other people solely because of his or her disability. Consistent with 36 CFR 212.1, FSM 2353.05, and Title V, Section 507(c), of the Americans With Disabilities Act, wheelchairs and mobility devices, including those that are battery-powered, that are designed solely for use by a mobility-impaired person for locomotion and that are suitable for use in an indoor pedestrian area, are allowed on all NFS lands that are open to foot travel.

Access by American Indians

Concerns were raised by American Indians and tribal representatives that this proposal would unduly restrict access to sacred sites or traditional gathering areas that are accessed via motorized cross-country travel or by unauthorized routes. Elderly or infirm tribal members may be prevented from participating in tribal activities if motor vehicle access is denied. Such access has been traditionally granted as long as resource damage can be prevented.

Motor vehicle use that is specifically authorized under a written authorization issued under Federal law or regulations is exempt from motorized travel management ((36 CFR 212.51 (8)). The Forest Supervisor can provide such authorization. This will ensure that motor vehicle access to sacred sites or gathering areas may continue; such access will not be affected by this proposal.

Environmental Consequences

Alternative 1

Direct and indirect effects of the prohibition of cross-country motorized vehicle travel

Under the no action alternative, no cross-county travel prohibition would be put into place. About 497 miles of unauthorized routes would continue to have no status or authorization as NFTS facilities, and motor vehicle travel by the public would not be limited to designated routes.

There is no anticipated change in motorized or non-motorized use on the KNF; therefore, it is assumed that current levels of recreation provide an accurate representation of the effects of visitation on the local economy. There are no predictions of changes to current economic conditions.

The only change in the amount of recreation use on the Forest would be that occurring as a natural progression from changes in population and preferences for recreational activities. Since population is not expected to increase more than 0.3% per year, there would be minimal effects from population growth. Preferences for recreational activities are difficult to predict as discussed earlier.

The short-term and long-term effects of cross-country motorized travel include continuing potential impacts to neighboring private lands. Under this alternative, 213 miles of unauthorized routes lie within ½ mile of private lands within the National Forest boundary; those residents would continue to be affected by noise and dust from off-road travel.

Access to dispersed recreation sites is not affected under this alternative. In both the short and long term, no change in motorized access to dispersed recreation activities would occur.

Direct and indirect effects of adding facilities to the NFTS

No additions to the existing NFTS would be made under this alternative. No direct or indirect effects would result.

Direct and indirect effects of changes to the existing NFTS

No changes to the NFTS would be made for vehicle class, or class of roads and trails, under this alternative. No direct or indirect effects would result except for the effects on residents of private lands inside the NFS boundary where the use of non-highway legal vehicles would continue to be allowed. Since this alternative does not restrict that use, motorized vehicle users would be positively affected and residents of private land would be negatively affected.

Cumulative effects

Adding the ongoing and reasonably foreseeable road actions to the effects of not prohibiting cross-country travel would reduce the number of miles on which motorized vehicle travel can occur by 49 miles on the west side of the Forest and increase the number of miles by 25 on the east side (Goosenest Ranger District). None of the miles removed from, or added to, the NFTS by ongoing or reasonably foreseeable actions on the KNF are adjacent to private land. Given this information, and the fact that no measurable direct and indirect effects on society, culture or the economy would occur under the no action alternative, there would also be no measurable cumulative effects.

In the 7-county analysis area, other ongoing and reasonably foreseeable projects are occurring that may cumulatively affect the social environment. National Forests in Jackson, Josephine, Klamath, Trinity, Del Norte, Humboldt, and the rest of Siskiyou County outside the KNF are all implementing the Travel Management Rule that will prohibit cross-country travel. This change in management will profoundly affect the type (and potentially amount) of motorized use on these National Forests. No decisions have yet been published for these lands so it cannot be estimated how many unauthorized routes or open riding areas might be added. Individually, these decisions may have minimal impacts on social and economic conditions; however, cumulatively they may affect motorized access and travel in the analysis area in a way that will have some measurable, but currently unknown, effects. This may affect the availability of substitute motorized recreational activities, and may change employment and income conditions in the analysis area, as well as influence the lifestyles, attitudes, beliefs and values of residents. The amount to which the socioeconomic environment would be affected, as well as the distribution of effects, cannot be precisely determined from the information available. The KNF motorized travel management decision, however, is unlikely to add substantially to any cumulative effects.

Federal lands under the management of Federal agencies other than the Forest Service may also undergo changes to transportation systems that would influence cumulative effects. Currently, the Bureau of Land Management (BLM) manages a substantial land base in the analysis area and supports a variety of motorized recreational opportunities. The Arcata Field Office manages the Samoa Dunes Recreation Area which allows year-round OHV use on 220 acres. Another area open to OHV use is the waveslope at South Spit; however, a 15 mph speed limit is imposed and no play activities are allowed (Cann, 2009). There are currently no reported projects planned by the Arcata Field Office that would substantially influence motorized recreation on these lands. The Redding and Alturas Field Offices also manage lands on the California side of the analysis area. Although some OHV roads and trails exist in close proximity but not directly adjacent to the KNF, there are no present or reasonable foreseeable projects that would influence motorized recreation to a large extent (Zaffarano, 2009; Singleton, 2009). Thus, any influence on cumulative effects would be minimal.

The BLM's Medford Field Office is managing projects that could influence motorized recreation in the analysis area. In December 2008, the BLM issued a Record of Decision for the Western Oregon Plan Revision; plans under the revision included the designation of seven OHV emphasis areas (Byrd, 2009). This decision has been overturned by the 9th Circuit Court of Appeals; however, the OHV areas could be proposed in a revised decision. The Timber Mt. OHV Area Management Plan Draft EIS, released in February 2009, identifies existing trails to be designated as part of an OHV trail system and analyzes alternatives providing additional OHV opportunities on adjacent private lands (USDI Bureau of Land Management, 2009). These projects would create additional opportunities for motorized recreation, and serve as substitute activity areas for those on the KNF.

Lands under private ownership offer additional opportunities for motorized recreation. Both authorized and unauthorized travel across private land occurs in the analysis area. The Timber Mt. OHV Area Management Plan Draft EIS addresses OHV use on private lands adjacent to BLM land. There may be other projects prohibiting or improving motorized recreation by large scale landowners that could impact social and economic conditions. Private land developments would likely require a permit or fee, which could affect the public's willingness to use these lands. Possible projects on private land cannot be considered "reasonably foreseeable" at this time as they have not been publicly proposed. Surveying private land owners in the analysis area is outside the scope of this analysis; actual implications for cumulative effects remain unknown.

Alternative 2

Direct and indirect effects of the prohibition of cross-country motor vehicle travel

This alternative prohibits cross-country vehicle travel on 1.2 million acres. This will be a substantial loss of motorized recreation opportunity on the KNF. This prohibition could result in fewer visitor days for motorized recreation, if visitors only wish to travel cross-country. Since OHV use is currently low and generated primarily by local users, it is likely that restrictions on cross-county travel under this alternative would not substantially reduce visits. The effects of this alternative on employment may not be evenly distributed; communities and businesses in close proximity to areas previously open to cross-country travel are likely to be more affected than similar communities and businesses in other parts of the analysis area. Due to unavailability of data at any level below the county, estimating the effects at such a small scale is outside the scope of this analysis.

Changes due to prohibiting motorized recreation could stimulate a transformation in recreational visits for non-motorized and other activities. This may serve to mitigate any adverse economic impacts resulting from fewer motorized recreation visits, if fewer visits occur. Currently data do not exist to estimate changes in jobs and income resulting from the substitution effect between motorized and other recreational activities. Total jobs and income supported by

recreation on the KNF are a very small percentage of total economic activity. Therefore, any economic impacts that would be realized under this alternative would be negligible.

Effects of this change would be noticed most by local residents. Analysis of the social environment indicates that both motorized and non-motorized forms of recreation are important to user groups in the analysis area. Advocates of cross-country motorized recreation would be more limited in terms of access; this could adversely impact the value they experience from use of the KNF. There might be a slight net loss in motorized recreational visits, or visitation may relocate to existing NFTS routes. The total value experienced by stakeholders concerned with motorized recreation would likely decline as opportunities to participate in such forms of recreation decline.

User groups concerned with other forms of recreation requiring motorized access may also be adversely affected. For example, dispersed camping is a common activity among local residents. The prohibition of cross-county travel would limit motorized access to dispersed recreation sites. This is more relevant on the Goosenest District, where terrain is more accommodating to cross-county travel. Going elsewhere for recreation could adversely affect local residents. Increased travel time and fuel consumption, as well as additional expenses such as campground fees, would limit the substitutability of recreation on the KNF for many individuals. Additionally, the quality of the experience at other sites may not be comparable to the quality they have traditionally experienced. Knowing that motorized access to certain areas would be prohibited may cause ideological impacts that result in individuals becoming more disconnected from the KNF.

The prohibition of cross-county travel may also improve natural resource conditions, which could then increase opportunities for non-motorized recreation. Advocates of quiet recreation and user groups concerned with natural resources would likely experience an increase in well-being due to greater restrictions in motorized access. There appears to be a tradeoff between opportunities provided for different user groups. Forest resources are in fixed supply; as opportunities for non-motorized recreation would increase, opportunities for cross-country motorized recreation decrease. In terms of economic impacts, it is likely that changes in use by one group would mitigate changes in use by the other group. In terms of net social welfare, there may be individual user groups that are adversely affected. Currently there is no means of quantitatively measuring the net impact to social welfare.

Closure of 405 miles of unauthorized routes to motorized use, especially those in areas with resource concerns, would have a positive benefit to stakeholders interested in conservation. The prohibition on cross-country travel will reduce dust, noise and presence of OHVs on KNF lands adjacent to private lands. This will improve the social well-being of some local residents.

Direct and indirect effects of adding facilities to the NFTS

This alternative would add 92 miles of roads and motorized trails, and 2 designated open riding areas totaling 65 acres, to the NFTS. The added routes and designated open riding areas could serve to mitigate some of the loss in OHV recreation from prohibiting cross-country travel. Visitor use is expected to remain at the current levels, although use may be distributed differently. Under this alternative, 258 unauthorized routes would be added to the NFTS for access to dispersed recreation sites. This would mitigate some of the adverse effects of prohibiting cross-country travel to local residents participating in dispersed camping.

Under this alternative, 43 miles of unauthorized routes within ½ mile of private lands within the KNF boundary would be added to the NFTS. Residents on those lands would continue to be affected by the dust and noise generated by motorized activities on these routes.

Direct and indirect effects of changes to the existing NFTS

Alternative 2 would allow mixed use on an additional 119 miles of NFTS routes. Adding mixed use has been thoroughly analyzed and disclosed in Appendix C of this FEIS. These additions would increase motorized vehicle opportunities and could potentially offset some of the effects on OHV users of prohibiting cross-country travel.

Removing mixed use (non-highway legal vehicles would be prohibited from routes they now use) from 10 miles of road that access private lands will reduce the potential for dust, noise, trespass, and property damage from OHV use on or near private lands. Impacts to OHV users should be minimal, as most of these routes are short and dead-end at the private property.

Cumulative effects

Cumulative effects include the total change in social and economic conditions that would result from this alternative added to the direct and indirect effects of other ongoing and reasonably foreseeable activities being conducted in the analysis area, on both public and private lands. Ongoing and reasonably foreseeable road actions on the KNF include removing 49 miles of road on the west side of the Forest from the NFTS (and thus from motorized vehicle use), and adding 25 miles for motorized vehicle use on the east side (Goosenest Ranger District). Due to the large number of roads and the high mileage currently on the NFTS, the effects of reducing the NFTS by 24 miles, and the overall effect to Siskiyou County residents are considered to be minimal.

The KNF shares borders with the Rogue-Siskiyou NF, the Modoc NF, the Six Rivers NF, the Shasta-Trinity NF, and the Fremont-Winema NF. The KNF has been coordinating management of one NFTS road that extends from the Rogue-Siskiyou onto the KNF; the Forests have agreed to manage the road as ML 2 on both sides of the Oregon/California border to provide consistency.

Cumulative effects of actions in other parts of the analysis area are the same as discussed in Alternative 1.

Alternative 3

Direct and indirect effects of the prohibition of cross-country motor vehicle travel

The effects of the prohibition of cross-country motorized vehicle travel are the same as those described under Alternative 2. The closure of 497 miles of unauthorized routes to motorized use would have a positive benefit to stakeholders interested in conservation.

Direct and indirect effects of adding facilities to the NFTS

No additions to the existing NFTS would be made under this alternative. No direct or indirect effects would result.

Direct and indirect effects of changes to the existing NFTS

No changes to the NFTS would be made for vehicle class, or class of roads and trails, under this alternative. No direct or indirect effects would result except for the continuing effects on residents of private land adjacent to the KNF where the use of non-highway legal vehicles is allowed on 8 miles that dead-end at the private land boundary. Since this alternative does not restrict that use, motorized vehicle users would be positively affected and residents of private land would be negatively affected.

Cumulative effects

The cumulative effects of Alternative 3 would be similar to those described for Alternative 2 except there may be a greater displacement of motorized vehicle users from open areas of the KNF to other state, federal or private lands or onto existing KNF NFTS routes. There will be no miles of unauthorized routes added to the NFTS within ½ mile of private land.

Alternative 4

Direct and indirect effects of the prohibition of cross-country motor vehicle travel

The effects of prohibiting cross-country motorized vehicle travel would be the same as those described under Alternative 2. The closure of 490 miles of unauthorized routes to motorized use would have a positive benefit to stakeholders interested in conservation.

Direct and indirect effects of adding facilities to the NFTS

Social and economic effects of adding unauthorized routes to the NFTS would be minimal as there would be only 12 miles of roads and less than one mile of motorized trail added to the NFTS. Twenty-five routes to dispersed recreation sites would be added. The direct and indirect

effects would be similar to those reported for Alternative 3. There will continue to be a tradeoff among motorized and non-motorized activities, resulting in a loss of well-being to advocates of motorized recreation and a gain in social welfare to conservationists and participants in non-motorized activities that do not required motorized access. The distribution of effects across stakeholders remains unknown; however, benefits will be skewed towards opponents of motorized recreation. This alternative can improve the quality of non-motorized activities and opportunities for the protection of natural resources, and enrich the lifestyles of user groups with those concerns. Conversely, fewer routes suggest that there will be a decrease in the quality and diversity of motorized recreation opportunities which can deteriorate the social benefits to those user groups.

Adding fewer miles of routes could possibly lead to a greater disconnection between the Forest and local residents who participate in motorized recreation activities. There will be fewer opportunities for motorized access to dispersed camping, which can result in a greater loss in social welfare to those users. Conversely, this alternative will yield social benefits to individuals concerned with resource conservation and non-motorized activities.

Alternative 4 proposes less than 3 miles of road and trail route additions within ½ mile of private lands within the KNF boundary. Residents on those lands would continue to be affected by the dust and noise generated by motorized activities on these routes.

Direct and indirect effects of changes to the existing NFTS

Alternative 4 would allow mixed use on an additional 119 miles of NFTS routes. Adding mixed use has been thoroughly analyzed and disclosed in Appendix C of this FEIS. These additions would increase the motorized vehicle opportunities and offset some of the effects on OHV users of prohibiting cross-country travel.

Removing mixed use (non-highway legal vehicles would be prohibited from routes they now use) from 8 miles of road that access private lands will reduce the potential for dust, noise, trespass, and property damage from OHV use on or near private lands. Impacts to OHV users should be minimal, as most of these routes are short and dead-end at the private property.

Cumulative effects

This alternative would yield a substantial displacement of motorized recreation visitors. However, substitute activities would likely continue to occur within the analysis area. The only change to the cumulative effects reported under Alternative 2 would be differences in the distribution of social effects across user groups defined in the direct and indirect effects section of this alternative. Added to the effects of ongoing and reasonably foreseeable actions described in Alternative 2, the social and economic cumulative impacts of this alternative would be minimal.

Alternative 5

Direct and indirect effects of the prohibition of cross-country motorized vehicle travel

The effects of prohibiting cross-country motorized vehicle travel are the same as those described under Alternative 2. The closure of 428 miles of unauthorized routes to motorized use would have a positive benefit to stakeholders interested in conservation.

Direct and indirect effects of adding facilities to the NFTS

This alternative adds 47 miles of roads and 22 miles of motorized trails, and 53 acres of open riding area to the NFTS. Routes would be designated to 206 dispersed recreation sites. Motorized vehicle user groups would experience greater social welfare and there would be fewer opportunities for quiet recreation which may result in less social welfare experienced by groups interested in that. Advocates of dispersed camping would have motorized access to a large number and variety of sites.

Social benefits would accrue more towards groups with interests in motorized access and recreation than to others.

Alternative 5 proposes 24 miles of route additions within ½ mile of private lands that are within the KNF boundary. Residents on those lands would continue to be affected by the dust and noise generated by motorized activities on these routes.

Direct and indirect effects of changes to the existing NFTS

Alternative 5 would allow mixed use on an additional 272 miles of NFTS routes. Adding mixed use has been thoroughly analyzed and disclosed in Appendix C of this FEIS. These additions would increase the motorized vehicle opportunities and offset some of the effects on OHV users of prohibiting cross-country travel.

Removing mixed use (non-highway legal vehicles would be prohibited from routes they now use) from 8 miles of road that access private lands will reduce the potential for dust, noise, trespass, and property damage from OHV use on or near private lands. Impacts to OHV users should be minimal, as most of these routes are short and dead-end at the private property.

Cumulative effects

The cumulative effects would be similar to those of Alternative 2.

Alternative 6

Direct and indirect effects of the prohibition of cross-country motorized vehicle travel

The effects of prohibiting cross-country motorized vehicle travel are the same as those described under Alternative 2. The closure of 438 miles of unauthorized routes to motorized use would have a positive benefit to stakeholders interested in conservation.

Direct and indirect effects of adding facilities to the NFTS

This alternative would add 41 miles of roads, 18 miles of motorized trails, and 53 acres of open riding areas to the NFTS. Routes would be designated to 164 dispersed recreation sites. The social welfare of motorized users would be decreased from the current situation, but there would continue to be a fair number of motorized access routes to dispersed recreation sites. Advocates of resource conservation and quiet non-motorized recreation would be better off than currently. Thus, a tradeoff among activities on the Forest would still exist; the exact distribution of effects across stakeholders remains unknown.

Alternative 6 proposes 23 miles of route additions within ½ mile of private lands within the KNF boundary. Residents on those lands would continue to be affected by the dust and noise generated by motorized activities on these routes.

Direct and indirect effects of changes to the existing NFTS

Alternative 6 would allow mixed use on an additional 105 miles of NFTS routes. Adding mixed use has been thoroughly analyzed and disclosed in Appendix C of this FEIS. These additions would increase the motorized vehicle opportunities and potentially offset some of the effects on OHV users of prohibiting cross-country travel.

Removing mixed use (non-highway legal vehicles would be prohibited from routes they now use) from 8 miles of road that access private lands will reduce the potential for dust, noise, trespass, and property damage from OHV use on or near private lands. Impacts to OHV users should be minimal, as most of these routes are short and dead-end at the private property.

Cumulative Effects

The cumulative effects would be similar to those discussed under Alternative 2.

Alternative 7

Direct and indirect effects of the prohibition of cross-country motorized vehicle travel

The effects of prohibiting cross-country motorized vehicle travel are the same as those described under Alternative 2. The closure of 423 miles of unauthorized routes to motorized use would have a positive benefit to stakeholders interested in conservation.

Direct and indirect effects of adding facilities to the NFTS

This alternative adds 53 miles of roads, 21 miles of motorized trails, and 53 acres of open riding area to the NFTS. A total of 192 routes would be designated to access dispersed recreation sites. Motorized vehicle user groups would experience greater social welfare and there would be fewer opportunities for quiet recreation and potentially less resource conservation which may result in less social welfare experienced by some groups.

Social benefits would accrue more towards groups with interests in motorized access and recreation than to others.

Alternative 7 proposes 23 miles of route additions within ½ mile of private lands within the KNF boundary. Residents on those lands would continue to be affected by the dust and noise generated by motorized activities on these routes.

Direct and indirect effects of changes to the existing NFTS

Alternative 7 would convert 130 miles of ML 3 road to ML 2, and add 131 miles of mixed use on ML3 roads. Adding mixed use has been thoroughly analyzed and effects disclosed in Appendix C of this FEIS. These additions would increase the motorized vehicle opportunities and offset some of the effects on OHV users of prohibiting cross-country travel.

Removing mixed use (non-highway legal vehicles would be prohibited from routes they now use) from 8 miles of road that access private lands will reduce the potential for dust, noise, trespass, and property damage from OHV use on or near private lands. Impacts to OHV users should be minimal, as most of these routes are short and dead-end at the private property.

Cumulative effects

The cumulative effects would be similar to those of Alternative 2.

Environmental Justice

While American Indian and low-income populations may exist in greater presence in the analysis area than the general population of the states of Oregon and California, none of the alternatives are expected to have disproportionately high and adverse human health or environmental effects

on these groups. Impacts to local communities are expected to be negligible, and there is no reason to suspect that any impacts will disproportionately affect minority and low income populations.

Civil Rights

All action alternatives will restrict motorized access. This may have a greater effect on the elderly and physically disabled than on the younger or more physically fit because it will be more difficult for hunters to retrieve game animals without using motorized vehicles. Access to dispersed recreation sites by individuals who require assistive devices will be more difficult in alternatives that limit or prohibit motorized access to these sites. This restriction would not apply to motorized assistive devices for mobility-impaired individuals; however, due to slope and rough ground, it is unlikely that such devices would be able to operate effectively more than 30 feet from most currently existing KNF roads. Because these restrictions are applied consistently to everyone, however, they are not considered to be discriminatory.

Summary of Effects Across All Alternatives

No alternative has a disproportionate effect on minorities or low income populations; there are no discriminatory effects under any alternative.

Alternative 1 provides the greatest opportunity for motorized use on the Forest, because it continues to allow vehicle use of 1.2 million acres and motorized access to any dispersed site on that acreage. Social benefits to various users are balanced differently in the action alternatives. Alternatives 2, 5, 6 and 7 do not accommodate cross-country motorized vehicle use but provide a diversity of motorized recreation opportunity on roads, trails, and open riding areas; motorized access is provided to a large number of identified dispersed recreation sites. Alternatives 3 and 4 do not accommodate off-road travel, and provide little or no motorized recreation opportunity on roads, trails, or open riding areas; however, these alternatives provide the most non-motorized opportunity and the highest benefit to quiet recreation enthusiasts. Alternative 1 continues to allow motorized access on NFS lands up to the boundaries of private lands, where landowners are struggling with noise, dust, and property damage generated by motorized activities. The action alternatives all deal effectively with this by prohibiting cross-country motorized vehicle travel, and removing motorized use from roads that access private property; all but Alternative 3 also remove non-highway legal vehicle use from roads that dead-end at private property.

There is little evidence of any substantial effect of any action alternative on the economy of the analysis area. Table SER-1 provides a comparison of the effects of alternatives on the social indicators.

Table SER-1. Comparison of Alternatives, and the Social Effects of Alternatives

	Mileage/Acres Proposed as Open to Motorized Use (Alternative 1) or to be Added to NFTS (Action Alternatives) and Group Receiving Advantage by Alternative						
	Alt 1	**Alt 2**	**Alt 3**	**Alt 4**	**Alt 5**	**Alt 6**	**Alt 7**
Miles of Route Additions Group receiving advantage	0 motorized vehicle users	92 motorized vehicle users	0 users of non-motorized recreation	7 motorized vehicle users	69 motorized and non-motorized users	59 motorized and non-motorized users	74 motorized and non-motorized users
Acres available to motorized use Group receiving advantage	1,200,000 motorized vehicle users	65 motorized and non-motorized users	0 users of non-motorized recreation	0 users of non-motorized recreation	53 motorized and non-motorized users	53 motorized and non-motorized users	53 motorized and non-motorized users
Number of Dispersed Rec. Sites Accessed Group receiving advantage	Not calculated a	258 motorized users of dispersed sites	0 users of non-motorized recreation	25 users of non-motorized recreation	206 motorized users of dispersed sites	164 motorized users of dispersed sites	192 motorized users of dispersed sites
Miles of routes added within ½ mile of private land Group receiving advantage	213 (existing) Motorized vehicle users	43 Motorized vehicle users	0 Private landowners	2.5 Private landowners	24 Private landowners & motorized vehicle users	23 Private landowner & motorized vehicle users	23 Private landowner & motorized vehicle users
Miles of Mixed Use Added Group receiving advantage	0 None	119 motorized vehicle users	0 None	119 motorized vehicle users	272 motorized vehicle users	105 motorized vehicle users	131 motorized vehicle users
Miles of Mixed Use Removed[b] Group receiving advantage	0 motorized vehicle users	10 Private landowners	0 motorized vehicle users	8 Private landowners	8 Private landowners	8 Private landowners	8 Private landowners
Miles of ML 3 Road Converted to ML 2 Group receiving advantage	0 None	0 None	0 None	0 None	0 None	0 None	130 motorized vehicle users

a - For alternative 1, any site that can be accessed by vehicle can be considered a dispersed recreation site. It is not possible to calculate the # of such sites for which motorized access is feasible.
b –Where such use is currently allowed.

Compliance with the LRMP and Other Direction

Alternative 1 implements the Klamath National Forest LRMP, which allows cross-country motorized travel on most land allocations, and complies with the applicable standards and guidelines. However, the LRMP, as written, is not in compliance with the Travel Management Rule. No motor vehicle use map would be produced.

The action alternatives all meet the applicable LRMP standards; however, they would all require a Forest Plan amendment to prohibit cross-country motorized travel in order to be consistent with the Travel Management Rule.

Cultural Resources

Introduction

Cultural resources provide information about past human behavior and activities. They are found in a variety of physical forms that include, but are not limited to, material objects, archaeological sites, historic architecture, and cultural landscapes. Cultural resources are non-renewable and frequently consist of ephemeral materials susceptible to destruction or deterioration.

Congress declared in 1966 that it would be national policy to "administer federally owned, administered, or controlled prehistoric and historic resources in a spirit of stewardship for the inspiration and benefit of present and future generations" (National Historic Preservation Act). This need was made more explicit when the National Historic Preservation Act (NHPA) was amended in 1980 and Section 110 was added to expand and underscore Federal agency responsibility for identifying and protecting historic properties and avoiding unnecessary damage to them. Many historic properties are fragile and, once damaged or destroyed, they can not be repaired or replaced. The term "historic properties" is used interchangeably with "cultural resources" or "cultural resource sites" throughout this document. The former has a more specific definition according to the NHPA, but the two are used synonymously here as a literary convenience to reduce repetition.

Section 106 of the NHPA compels federal agencies to take into account the effect of its undertakings on any district, site, building, structure, or object that is included in or eligible for inclusion in the National Register of Historic Places (36 CFR 60) (Historic Properties). The Travel Management rule requires that the effects on cultural resources be considered, with the objective of minimizing damage, when designating roads, trails, and areas for motor vehicle use on National Forest lands (36 CFR 212.55(a), 212.55(b)(1)).

Analysis Framework: Statute, Regulation, LRMP, and Other Direction

Direction relevant and specific to this project as it affects cultural resources includes:

The National Historic Preservation Act of 1966 (NHPA), as amended, provides comprehensive direction to federal agencies about their historic preservation responsibilities. The Act extends the policy in the Historic Sites Act of 1935 (49 Stat. 666; 16 U.S.C. 461-467) to include resources that are of State and local significance, expands the National Register of Historic Places (NRHP), and establishes the Advisory Council on Historic Preservation and State Historic Preservation Officers. Section 106 of the NHPA directs all Federal agencies to take into account effects of their undertakings (actions, financial support, and authorizations) on properties

included in or eligible for the National Register. Section 110 of the NHPA sets inventory, nomination, protection, and preservation responsibilities for Federally-owned historic properties.

Executive Order 11593: Protection and Enhancement of the Cultural Environment directs Federal agencies to inventory cultural resources under their jurisdiction, to nominate to the National Register of Historic Places all Federally owned properties that meet the criteria, to use due caution until the inventory and nomination processes are completed, and to assure that Federal plans and programs contribute to preservation and enhancement of non-Federally owned properties.

Title 36, Code of Federal Regulations, Part 800, outlines the Advisory Council on Historic Preservation's (ACHP) regulations for implementing Section 106 of the NHPA.

Forest Service Policy for Section 106 of the NHPA Compliance in Travel Management: Designated Routes for Motor Vehicle Use (2005) outlines Forest Service policy and minimal requirements for considering possible effects to historic properties that may be associated with designating routes and areas as part of a National Forest's travel management process.

Programmatic Agreement among the U.S.D.A. Forest Service, Pacific Southwest Region, U.S.D.A. Forest Service, Intermountain Region's Humboldt-Toiyabe National Forest, California State Historic Preservation Officer, and Advisory Council on Historic Preservation Regarding the Process for Compliance with Section 106 of the National Historic Preservation Act for Designating Motor Vehicle Routes and Managing Motorized Recreation on the National Forests in California (USDA Forest Service 2006 - Motorized Recreation PA) defines the area of potential effects and includes a strategy outlining the requirements for cultural resource inventory, evaluation of historic properties, and effect determinations; it also includes protection and resource management measures that may be used where effects may occur.

The Klamath National Forest Land and Resource Management Plan (LRMP) outlines the minimum conditions that will be retained throughout the Forest in order to ensure resource protection and enhancement. The LRMP specifically lists the following standards and guidelines, management area specifications, and the minimum resource conditions necessary to protect cultural resources.

24-3 Conduct a cultural resource survey before all ground-disturbing activities in compliance with applicable Federal historic preservation legislation (FSM 2360). In addition, surveys and applicable site evaluations should be completed before a Record of Decision or Decision Notice is signed. Document the results of project-level cultural resource inventories in the cultural resources report.

2-10 Surveys are expected to be adequate to identify cultural sites. All identified cultural sites will be avoided until a determination of significance can be made.

24-7 Consider the effects of all Forest Service undertakings on significant cultural resources. Develop measures to avoid or mitigate any adverse effects. Give priority to those properties that may be affected by project activities.

24-14 Maintain significant and eligible historic sites and mitigate any adverse effects. Stabilization or rehabilitation may be carried out for significant sites that have been damaged.

24-17 Monitor mitigation measures established during the environmental analysis of a given project to insure all stipulations are being met. Current records are necessary to indicate compliance with legal mandates. Tracking of the mitigation plan is necessary during and following ground-disturbing activities where cultural resource values are present.

24-25 Protect traditional Native American rights and practices (Public Law (PL) 95-341) to insure the integrity of the site and to assure that use will continue to occur and will not be impaired.

MA8-5 Do not direct recreational use to Native American cultural areas. River-related recreational use will be managed to minimize conflicts.

Effects Analysis Methodology

Section 106 of the National Historic Preservation Act (1966 and amendments) requires federal land-managing agencies to take into account the effects of their undertakings on historic properties. The regulation to implement the NHPA (36 CFR 800) defines a historic property as:

> "…any prehistoric or historic district, site, building, structure, or object included in, or eligible for inclusion in, the National Register of Historic Places maintained by the Secretary of the Interior. This term includes artifacts, records, and remains that are related to and located within such properties. The term includes properties of traditional religious and cultural importance to an Indian tribe or Native Hawaiian organization and that meet the National Register Criteria. (36 CFR §800.16(1)(1))"

For the purposes of this analysis, all cultural resources within the Area of Potential Effect (APE) are considered historic properties regardless of whether or not they have been formally evaluated for the National Register of Historic Places (NRHP). In order for the Forest to determine the potential effects of the proposed

action on historic properties, it is first necessary to identify the APE. The 36 CFR§800 regulations define an APE as:

> "…the geographic area or areas within which an undertaking may directly or indirectly cause alterations in the character or use of historic properties, if any such properties exist. The area of potential effects is influenced by the scale and nature of an undertaking and may be different for different kinds of effects caused by the undertaking."(36 CFR§800.16(d))

The APE for the cultural resources component of the travel management project is specifically defined in the Motorized Recreation PA :

> "APEs include vehicular use areas, such as roads, trails, routes, corridors, stopping points, trailheads, off-route use areas, or other associated areas where maintenance for and motorized recreation occur or that are considered for designation."

The Motorized Recreation PA includes a strategy that outlines cultural resource inventory requirements for routes and areas considered for addition to the NFTS; however, needs and priorities for survey may be based upon a variety of factors including motorized recreation use levels. Use levels are as follows:

Heavy use	1501 or more motorized vehicles per week
High use	501-1501 motorized vehicles per week
Medium use	101-500 motorized vehicles per week
Low use	25-100 motorized vehicles per week
Light use	Fewer than 25 motorized vehicles per week

Motorized vehicle use of roads and routes on the Klamath National Forest falls into the "light use" category. Thus, cultural resource inventory of many of the routes identified on the KNF were deferred. Of the 497 miles of unauthorized routes considered in this project, 195 miles were designated as not needing immediate inventory (inventory can be deferred). However, where existing cultural resource data indicated the presence of a site, a field visit was conducted to verify the level of effect to the site as a result of motorized vehicle use.

Prior to the inventory of routes and the effects assessment, a background literature review and examination of cultural resource databases and documents maintained by the KNF was conducted. Using this information, cultural resource field surveys were completed on selected routes and open riding areas included in one or more action alternatives to identify new cultural resource sites or examine existing ones. Surveys were conducted according to methods and

standards outlined in the Motorized Recreation PA. Reports documenting the results of the surveys (Goetz 2009a and 2009b, LaLande, 2008, 2009a and 2009b) are in the project record on file at the KNF Supervisor's Office, Yreka, CA. These reports include site specific analysis of cultural resources associated with all routes or open riding areas being considered for addition to the NFTS. The reports also supply background information, outline the methodologies employed and describe the condition of sites. Site conditions were then quantified by assessing effects to them as outlined in Table CR-1.

Table CR-1. Severity of effects on cultural resources and requirements for mitigation

Severity of Effects	Definition	Explanatory Notes
Negligible	Route bisects some portion of the cultural resource site, but the effect on NRHP values is insignificant	No measurable effect on the cultural resource; no mitigation measures are prescribed.
Minor	Effects on cultural resources are minor, but not insignificant. Integrity of the NRHP values may diminish if measures are not taken to alleviate the potential effect.	Some type of mitigation measure may be required. Monitoring may be prescribed to ensure that the minor degree of disturbance does not increase over time.
Moderate	Effects on cultural resources are either localized or noted in multiple areas. Materials associated with NRHP values exhibit some degree of damage or alteration, but NRHP integrity can be retained or improved if the detrimental activity is curtailed	A moderate determination requires mitigation. An adaptive management strategy will be employed where progressively more complex and potentially costly protective measure will be employed to eliminate a sustained potential for adverse effects.
Major	Effects on cultural resources are severe. If that particular route is added to the system without mitigation measures, the action would result in adverse effects to the NRHP values.	More complex and potentially costly mitigation measures are required to prevent direct effects to the resource. In most cases, the only viable option may be re-routing the road/trail around the resource. Mitigation may necessitate scientific data recovery, which can be expensive and requires additional consultation under 36 CFR§800.

Assumptions Specific to the Cultural Resource Analysis

- Unauthorized routes and open areas of concentrated use may have already affected historic properties within route/area prisms.
- Under the action alternatives, use will continue at current levels or may slightly increase over time on the NFTS with the prohibition of cross-country motorized travel. (See the Society, Culture and Economy section of this chapter for support for this assumption.)

- There is no measurable difference in potential impact to cultural resources, given identical environmental variables, between that generated by different vehicle classes, i.e., full size four wheel drive vehicles, off-road vehicles, and motorcycles.
- Per the Motorized Recreation PA, all cultural resources identified within the APE for all alternatives adding facilities to the NFTS are considered historic properties for the purposes of this undertaking, unless they already have been determined not eligible in consultation with the CA SHPO or through other agreed-on procedures (36 CFR §60.4; 36 CFR §800).
- Mitigation measures developed for all action alternatives per the Motorized Recreation PA will eliminate or lessen effects to cultural resources (Chapter 2).

Data Sources

- Site-specific cultural resource inventories. The Forest conducted cultural resource field surveys for this undertaking throughout 2008 and 2009. The primary objective of these surveys was to identify historic properties in the APE that may be affected by the undertaking and collect information on their current condition.
- Cultural resource records, previous survey data, historic archives, site records, maps and GIS spatial layers.

Indicators

- The average number of historic properties per acre protected from creation of new routes or from addition of routes to the NFTS is Degree to which the integrity of historic property values are diminished (measured by the number of properties in each category of severity of effects)
- Number of historic properties within unauthorized routes at risk from ongoing motor vehicle use (measured by the number of properties sustaining minor to major effects)
- Average number of historic properties at risk if new routes or areas are created (to calculate the number of sites that might be affected by Alternative 1 in which cross-country motorized travel is not prohibited, the number of surveyed sites (2,224) per surveyed acre (787,308) as of 2006 were used to determine the number of sites that may potentially be affected on the 1,200,000 acres open to cross-country travel. For action alternatives, the number of historic properties at risk if new routes or areas are created would equal the number sustaining minor to major effects in each alternative, based on the number of routes and acres of open riding areas added to the NFTS, because new routes or areas cannot be created without a future decision based on separate environmental analysis and disclosure.

Methodology by Action

1. Direct and indirect effects of the prohibition of cross-country motorized vehicle travel.

Short-term timeframe: 1 year

Long-term timeframe: 20 years

Spatial boundary: Forest

Indicators: (1) Number of historic properties within unauthorized routes at risk from ongoing use; and (2) Average number of historic properties per acre at risk if new routes or open riding areas are created.

Methodology: Use existing data to identify cultural resources in the APE that may be at risk or affected if cross-country travel is not prohibited (Alternative 1) or will be protected from direct or indirect effects by prohibiting cross-country motorized travel (Alternatives 2 through 7).

2. Direct and indirect effects of adding facilities to the NFTS

Short-term timeframe: 1 year

Long-term timeframe: 20 years

Spatial boundary: Location of historic property

Indicator: Degree to which the integrity of historic property values are diminished, related to location, design, setting, materials, workmanship, feeling or association.

Methodology: Use existing data to identify the degree to which the integrity of historic property values in the APE may be diminished by routes or open riding areas that are proposed for addition to the NFTS (Alternatives 2, 4, 5, 6, and 7).

3. Direct and Indirect Effects of Changes to the existing NFTS

Changes to vehicle type on existing NFTS roads are not considered undertakings subject to NHPA Section 106 compliance (USDA Forest Service Policy for Section 106 of the NHPA Compliance in Travel Management: Designated Routes for Motor Vehicle Use (2005)). Motorized vehicles can already use NFTS roads. Allowing or prohibiting non-highway vehicle use will have no effect on cultural resources. This action will not be addressed further in this section.

4. Cumulative Effects

Cumulative effects are the additive effects of this project and of ongoing and reasonably foreseeable future actions (Appendix B). Past actions are considered part of the existing condition and are discussed in the Affected Environment. Ongoing and reasonably foreseeable future actions that may affect cultural resources include vegetation management projects (timber harvest, fuel reduction), ground-disturbing special use permits, livestock grazing and road-related projects (construction, reconstruction, decommissioning). The effects of all these actions on cultural resource sites are being, or will be, analyzed in each project environmental analysis. These types of projects have historically had minimal to no effects on historic properties due to the application of project design standards and mitigation measures. Project design standards and mitigation measures are being, or will be, developed and implemented for each project to minimize the effects of these activities to cultural resources.

Road-related actions are likely to have the same types of effects on cultural resource sites as the actions proposed in this motorized travel management project. Road-related actions will add 13 miles of ML 1 and 26 miles of ML 2 road to the NFTS, and remove 50 miles of ML 2 road. The environmental analyses of these actions all include compliance with NHPA section 106; cultural resource surveys will be completed as necessary, and consultation with the California or Oregon SHPOs will be undertaken if required. No effects on cultural resources from ongoing or reasonably foreseeable road-related actions are anticipated; therefore, the cumulative effects of each alternative are the sum of the direct and indirect effects.

Long-term timeframe: 20 years

Spatial boundary: Forest

Indicator: Number of historic properties affected by unauthorized routes that are at risk from ongoing use.

Methodology: Identify cultural resources in the APE that may be subject to direct or indirect effects.

Affected Environment

The objective of this section is to review the most current information available regarding the scale, nature, and condition of cultural resources identified within the project area.

Human presence on the lands managed by the Klamath National Forest begins with sporadic use by 11,000 years before present (BP) (Goebel 1996), with more distinct patterns of use appearing by 8000 to 6000 BP (Fentress 2002). The Shasta Valley, Klamath River and Butte Valley areas were all occupied by 7000 BP (Mack 1979, 1989, 1991; Jensen and Farber 1982), with Proto-Shastan and Modoc populations present by 5000 to 4000 BP (Cressman 1942).

Ethnographically, the east side of the KNF (Goosenest Ranger District) was occupied by Shasta, Klamath and Modoc, all of whom retain a presence in the area (Ray 1963; Silver 1978; Stern 1998). The Shasta were concentrated along the Klamath, Salmon and Scott Rivers, and their tributaries, where riverine resources were the focus of settlement and subsistence. The Klamath and, to a lesser degree the Modoc focused settlement and subsistence on the lacustrine resources of the Klamath Basin marshes (the Modoc focused more on terrestrial resources). These groups were traditionally "hunters and gatherers" relying on local plant and animal resources for subsistence as they became available. Consequently, these groups practiced a highly mobile "seasonal round" type of settlement pattern moving frequently across the landscape. Many trails established by these ethnographic groups for travel and trade became major travel routes across the forest during the historic era.

The west side of the Klamath is also represented by a long history of cultural interactions with tribal groups along the Klamath River. This can be depicted as the area west of Interstate 5, following the Klamath River to Orleans. Ethnographic documentation for the west side is reflected in research presented by William Bright (1978) in his discussions of the Karuk; Kathryn and Robert Winthrop's research of the Konomihu (1991); and Shirley Silver's (1978) research of the Shasta. In essence, riverine resources played a major role in settlement and subsistence patterns, as well as the spiritual connectivity to the land through scheduled ceremonies (Palmer 1980). Travel routes accessed groups for trade, acquisition of resources such as acorns, basketry materials, wildlife, and ceremonial activities.

Euro-American explorers of the 1820s-40s found the Hupa, Karuk, and Shasta people living along portions of the lower/middle Klamath River drainage. Ancestors of the Shasta and Karuk people, speaking Hokan-family languages are believed to have been long-time residents of the region, and apparently inhabited or used much of the western portion of the KNF, to the near exclusion of non-Hokan-speaking neighboring groups (such as the Hupa, the Takelma, the Klamath/Modoc, and the Wintu, respectively).

During the late 1820s through the 1840s, trappers and explorers began venturing into California. With the discovery of gold in Yreka in 1851 came a massive emigration of gold seekers and settlers into the area now encompassed by the Klamath National Forest. Numerous trails and routes crossing the Forest were the result, including: the Yreka Trail, a branch of the California National Historic Trail; the Tickner Road; the Lockhart Wagon Road, the Kelsey Trail, and the Deacon Lee Trail. These early roads were established to link settlements, transport supplies and access different mining communities.

In the 1870s, large-scale hydraulic mining of the area's low-elevation placer deposits began. These were generally well-capitalized operations that hired crews of wage laborers (many of them Chinese). From the 1870s into the early twentieth century, systems of high ditches,

headboxes, iron-pipe penstocks, giant nozzles, huge sluice systems, and the other accoutrements of hydraulic mining transformed some low-elevation areas into extremely modified landscapes of vast, linear 'washing pits' (the mined-out ancient alluvium) located within, adjacent, and parallel to the stream courses. Huge piles of alluvial cobbles and boulders accumulated within and near the washing pits as tailings – which today form an extensive tree-shaded/moss-covered habitat for small mammals, birds, and reptiles. Along the banks of the Klamath River, the size and depth of the river permitted large-scale hydraulic mining with wings dams exposing the river bed and "China pumps" removing the water seepage (this activity was then followed by early-twentieth century gold dredging in the creeks and rivers and along their banks).

With the end of the early years' labor-intensive placer operations, the area's mining population declined dramatically. In the nearby valleys, ranching took hold, with cattle and other livestock being driven up to the summer ranges in the mountains' high-elevation meadows. Lode (or "hard-rock) mining for gold in the bedrock slopes of the project vicinity began with small operations during the late nineteenth century. Soon after 1900, a number of better-capitalized, longer-term underground-mining operations took place.

Logging occurred throughout the Forest to supply lumber and various wood products to support other industries. On the Goosenest District, with its open Eastside Pine habitat and terrain, logging was and continues to be the primary industry. In 1904 the Weed Lumber Company began extending its railroad based logging from Weed, California, reaching Klamath Falls, Oregon in 1909. In the process of this and later expansion, a substantial railroad grade system was established to facilitate logging operations. These railroad grades provide the footprint for the majority of roads on the Goosenest.

During the same period, the U.S. Forest Service began managing the new established Klamath National Forest, building trails into the high country. Small-scale placer and lode mining attracted a number of individuals hard-pressed by the Great Depression; large-scale dredge-mining operations also occurred during this time along a number of stretches of the Klamath and Scott Rivers.

Livestock grazing has occurred on Forest lands since the 1850s when cattle, pigs, and sheep were raised to feed local miners. Seasonal patterns of stock movement between valleys and higher elevations developed with grazing on the Goosenest concentrated on the crest of the Cascades and in Butte Valley. However, after a series of large land exchanges in the 1930s and 1940s, grazing was substantially expanded on the Goosenest. Similarly, stock movement on the west side of the forest utilized high elevation areas such as the Siskiyou Crest to lower elevations such as Scott Valley. Stock trails from grazing activities are evident across all districts and many of these trails are still used today to move cattle to and from grazing allotments.

The Klamath National Forest has a history of recreational use, and opportunities for recreation exist at both developed as well as dispersed sites throughout the Forest. Recreational activities tend to concentrate at lake or creek-side settings (fishing, camping), high elevation snowparks (snowmobiling, cross-country skiing), the area of concentrated use at Juniper Flat along County Highway A12, the Humbug area of concentrated use, and at dispersed campsites (hunting).

Existing Conditions

A total of 2,880 cultural resource sites have been identified and mapped within the 1.2 million acres that are open for cross-country motorized use.

For this project, cultural resource specialists conducted field surveys in search of historic properties in the APE that may be affected by the undertaking. Field surveys identified 63 historic properties on or immediately adjacent to routes or open riding areas proposed for addition to the NFTS. On the west side of the Forest, 35 sites were identified; 30 sites were associated with routes and none with open riding areas. On the east side of the Forest, 28 prehistoric sites were identified; 20 sites were associated with routes and 8 sites are adjacent to, but not within, the proposed open riding area at Juniper Flat.

Environmental Consequences

This section outlines the effects of each action alternative on cultural resources. The disclosure of specific data related to the location or character of a historic property is regulated pursuant to stipulations in 36 CFR§800.11 and section 304 of the NHPA when disclosure may cause a significant risk. The LRMP also specifies that the location of cultural resource sites is confidential information. Therefore, information regarding the location of cultural resources or historic properties is provided by focus area instead of by route.

Effects on cultural resources take the form of direct effects, which are caused by the action and occur at the same time and place, and indirect effects, which are caused by the action and are later in time or farther removed in distance, but are still reasonably foreseeable.

Disturbance agents can combine in a variety of ways to create a potential threat to historic properties. Common direct effects include a direct impact of vehicle tires on cultural resources, or movement of artifacts as soil is displaced. Indirect effects could include exposure of artifacts from soil displacement, down-cutting or rutting in route surfaces, displacement over time, damage from vandalism, alteration of historic structures, and looting.

Alternative 1

Direct and indirect effects of the prohibition on cross-country motorized vehicle travel

This alternative does not prohibit cross-country vehicle travel. Continued off-road vehicle travel is likely to result in the creation of new routes which could adversely affect the 2,880 historic properties that have been identified on the 1.2 million acres of lands open for cross-country travel. The 63 historic properties identified for this project will continue to be subject to disturbance. Seven properties are not currently being affected; 58 show negligible to major effects. Continued cross-country travel, without mitigation, could increase the severity of effects. The severity of effects to the 8 currently affected sites adjacent to the Juniper Flat area of concentrated use would continue and may increase. Tables CR-2 through CR-4 display the effects of this alternative.

Expansion of the unauthorized route system could also increase the number of properties that may be affected. There is no way to accurately estimate the number of properties that might be affected by the proliferation of unauthorized routes.

Direct and indirect effects of adding facilities to the NFTS

This alternative does not add facilities to the NFTS. There will be no effects on cultural resources from this action.

Cumulative effects

Cumulative effects for this alternative are the same as the direct and indirect effects described above.

Alternative 2

Direct and indirect effects of the prohibition on cross-country motorized vehicle travel

The prohibition of cross-country vehicle travel on 1.2 million acres of the KNF would have a beneficial effect on cultural resources throughout the Forest in the short and long term. It would curtail the creation of new routes, eliminating the threat of additional impacts to 2,800 identified historic properties on 1.2 million acres of lands open for cross-country travel. This prohibition would protect unidentified sites from direct impact of vehicles and from the soil displacement and erosion that can occur from unmanaged motor vehicle use on routes that are not well-sited. Under this prohibition, there will be no addition of unauthorized routes and all future proposed additions to the NFTS will require compliance with the NHPA section 106. Potential effects to cultural and historic properties will be identified and mitigated through separate environmental analyses. Effects to the 8 sites adjacent to the Juniper Flat open riding area from motorized vehicle use will

be eliminated by this prohibition. Overall, effects from prohibiting cross-country motorized vehicle travel are considered to be beneficial to cultural resources.

Direct and indirect effects of adding facilities to the NFTS

This alternative adds 92 miles of routes and 65 acres in two open riding areas to the NFTS. There are no identified sites in either of the open riding areas. The routes proposed for addition to the NFTS potentially affect 52 sites with identified historic properties; 47 sites are currently affected with negligible to minor effects, 4 are not currently affected, and effects to 1 site are moderate. The effects on these sites are displayed, by focus area, in Tables CR-2 through CR-4.

Of the 33 sites on the west side of the Forest, potential effects for 28 sites have been identified as negligible or minor; there is no current effect to 3 sites as displayed in Tables CR-2 and 3. Effects to 1 site are moderate; mitigations to protect this site are displayed in Table CR-3.

Of the 19 properties on the east side of the Forest that could be directly affected by this project, 1 was considered to not be affected. The other 18 properties are sustaining negligible to minor effects as displayed in Table CR-4. There are 8 sites located outside the Juniper Flat open riding area. These properties are not considered “at risk” in Alternative 2 due to the prohibition of cross-country travel. However, signing and barriers will be used along the boundary of the Juniper Flat open riding area to ensure that vehicles cannot leave the area and drive over these 8 sites (Table CR-5). These sites will be monitored according to the Motorized Recreation PA monitoring protocols for “at-risk” properties to protect them from unauthorized motorized vehicle use.

Cumulative effects

Cumulative effects for this alternative are the same as the direct and indirect effects described above.

Alternative 3

Direct and indirect effects of the prohibition on cross-country motorized vehicle travel

Effects of the prohibition of cross-country travel on cultural resources are the same as described in Alternative 2.

Direct and indirect effects of adding facilities to the NFTS

This alternative does not add facilities to the NFTS. There will be no effects on cultural resources from this action.

Cumulative effects

Cumulative effects for this alternative are the same as the direct and indirect effects described above.

Alternative 4

Direct and indirect effects of the prohibition on cross-country motorized vehicle travel

Effects of the prohibition of cross-country travel are the same as described in Alternative 2.

Direct and indirect effects of adding facilities to the NFTS

This alternative adds 7 miles of routes to the NFTS; the routes proposed for addition to the NFTS affect 2 identified historic properties on the east side of the KNF that are currently sustaining minor effects. There are no sites affected on the west side of the KNF. No open riding areas are added to the NFTS in this alternative. The direct or indirect effects to cultural resources from this action on these 2 sites are displayed in Table CR-4.

Cumulative effects

Cumulative effects for this alternative are the same as the direct and indirect effects described above.

Alternative 5

Direct and indirect effects of the prohibition on cross-country motorized vehicle travel

Effects of the prohibition of cross-country travel are the same as described in Alternative 2.

Direct and indirect effects of adding facilities to the NFTS

This alternative adds 69 miles of routes and 53 acres in two open riding areas to the NFTS. There are no identified sites in either of the open riding areas. The routes proposed for addition to the NFTS potentially affect 40 sites with identified historic properties; 35 sites are currently affected with negligible to minor effects, 4 are not currently affected, and effects to 1 site are moderate. The effects on these sites are displayed, by focus area, in Tables CR-2 through CR-4.

Of the 28 sites on the west side of the Forest, potential effects for 23 sites have been identified as negligible or minor; there is no current effect to 4 sites as displayed in Tables CR-2 and CR-3. Effects to 1 site are moderate; mitigations to protect this site are displayed in Table CR-3.

Of the 12 properties on the east side of the Forest that could be directly affected by this project, all are sustaining negligible to minor effects (Table CR-4). There are 8 sites located

outside the Juniper Flat open riding area. These properties are not considered "at risk" in Alternative 5 due to the prohibition of cross-country travel. However, signing and barriers will be used along the boundary of the Juniper Flat open riding area to ensure that vehicles cannot leave the area and drive over these 8 sites (Table CR-5). These sites will be monitored according to the Motorized Recreation PA monitoring protocols for "at-risk" properties to protect them from unauthorized motorized vehicle use.

Cumulative effects

Cumulative effects for this alternative are the same as the direct and indirect effects described above.

Alternative 6

Direct and indirect effects of the prohibition on cross-country motorized vehicle travel

Effects of the prohibition of cross-country travel are the same as described in Alternative 2.

Direct and indirect effects of adding facilities to the NFTS

This alternative adds 59 miles of routes and 53 acres in two open riding areas to the NFTS. There are no identified sites in either of the open riding areas. The routes proposed for addition to the NFTS potentially affect 39 sites with identified historic properties; 35 sites are currently affected with negligible to minor effects, 3 are not currently affected, and effects to 1 site are moderate. The effects on these sites are displayed, by focus area, in Tables CR-2 through CR-4.

Of the 27 sites on the west side of the Forest, potential effects for 23 sites have been identified as negligible or minor; there is no current effect to 3 sites as displayed in Tables CR-2 and CR-3. Effects to 1 site are moderate; mitigations to protect this site are displayed in Table CR-3.

Of the 12 properties on the east side of the Forest that could be directly affected by this project, all are sustaining negligible to minor effects as displayed in Table CR-4. There are 8 sites located outside the Juniper Flat open riding area. These properties are not considered "at risk" in Alternative 6 due to the prohibition of cross-country travel. However, signing and barriers are used along the boundary of the Juniper Flat open riding area to ensure that vehicles cannot leave the area and drive over these 8 sites as displayed in Table CR-6. These sites will be monitored according to the Motorized Recreation PA monitoring protocols for "at-risk" properties to protect them from unauthorized motorized vehicle use.

Cumulative effects

Cumulative effects for this alternative are the same as the direct and indirect effects described above.

Alternative 7

Direct and indirect effects of the prohibition on cross-country motorized vehicle travel

Effects of the prohibition of cross-country travel are the same as described in Alternative 2.

Direct and indirect effects of adding facilities to the NFTS

This alternative adds 74 miles of routes and 53 acres in two open riding areas to the NFTS. There are no identified sites in either of the open riding areas. The routes proposed for addition to the NFTS potentially affect 40 sites with identified historic properties; 35 sites are currently affected with negligible to minor effects, 4 are not currently affected, and effects to 1 site are moderate. The effects on these sites are displayed, by focus area, in Tables CR-2 through CR-4.

Of the 26 sites on the west side of the Forest, potential effects for 22 sites have been identified as negligible or minor; there is no current effect to 3 sites as displayed in Tables CR-2 and CR-3. Effects to 1 site are moderate; mitigations to protect this site are displayed in Table CR-3.

Of the 14 properties on the east side of the Forest that could be directly affected by this project, 13 are sustaining negligible to minor effects and 1 is not affected as displayed in Table CR-4. There are 8 sites located outside the Juniper Flat open riding area. These properties are not considered “at risk” in Alternative 7 due to the prohibition of cross-country travel. However, signing and barriers will be used along the boundary of the Juniper Flat open riding area to ensure that vehicles cannot leave the area and drive over these 8 sites as displayed in Table CR-5. These sites will be monitored according to the Motorized Recreation PA monitoring protocols for “at-risk” properties to protect them from unauthorized motorized vehicle use.

Cumulative effects

Cumulative effects for this alternative are the same as the direct and indirect effects described above.

Summary of Effects Across All Alternatives

The known cultural resource sites (historic properties) that may be affected by each alternative are displayed in Tables CR-2 through CR-5 by focus area. It is assumed that effects to sites would continue under Alternative 1; therefore, Alternative 1 is identified for each site even though mitigation measures would not be applied in this alternative. Each identified property was

assigned a severity of effects rating which resulted in the decision to remove the route from consideration or develop appropriate mitigation. These results are also displayed by focus area in Tables CR-2 through CR-5. The focus areas are the Humbug area (not including the open riding area because it contains no properties), the rest of the west side of the KNF (west of Interstate 5), the east side of the KNF (east of Interstate 5), and the area immediately adjacent to the Juniper Flat concentrated use area (in Alternative 1) or open riding area (in Alternatives 2, 5, 6, and 7).

Table CR-2. Historic properties associated with each alternative in Humbug area (outside open riding area)

Site #	Type of Effect	Nature of Effect	Severity of Effect	Protection Mitigation	Defer Survey ?	Alt. #
05-05-55-10	indirect	looting	minor	monitor	yes	1,2,5,6,7
05-05-55-162	indirect	looting	minor	monitor	yes	1,2,5,6,7
05-05-55-276	none	none	none	none	no	1,2,5,6,7
05-05-55-277	none	none	none	none	no	1,5
05-05-55-278	none	none	none	none	no	1,5,6,7
05-05-55-279	indirect	camping	minor	monitor	yes	1,2,5,6,7

Table CR-3. Historic properties associated with each alternative on west side other than in Humbug

Site #	Type of Effect	Nature of Effect	Severity of Effect	Protection Mitigation	Defer Survey ?	Alt. #
05-05-51-189	indirect	camping	minor	monitor	no	1,2
05-05-51-212	indirect	erosion/ camping	moderate	define route with barriers; sign & monitor	no	1,2,5,6,7
05-05-51-213	indirect	camping	minor	monitor	no	1,2
05-05-51-214	indirect	camping	negligible	none	no	1,2
05-05-52-14	indirect	logging	negligible	none	no	1,2,5,6,7
05-05-52-55	indirect	camping	negligible	none	no	1,2,5,6,7
05-05-52-87	indirect	camping	negligible	none	no	1,2,5,6,7
05-05-52-129	indirect	logging	negligible	none	no	1,2,5,6,7
05-05-52-152	indirect	camping	negligible	none	yes	1,2
05-05-52-181	indirect	camping	negligible	none	no	1,2
05-05-52-234	indirect	camping	negligible	none	no	1,2,5,6
05-05-52-245	indirect	camping	negligible	none	no	1,2,5,6,7
05-05-54-05	indirect	camping	negligible	none	yes	1,2,5,6,7
05-05-54-106	direct/ indirect	vandalism /camping	minor	monitor	no	1,2,5,6,7
05-05-54-107	indirect	camping	negligible	none	no	1,2,5,6,7
05-05-54-109	indirect	camping	negligible	none	no	1,2,5,6,7
05-05-54-112	indirect	camping/ privy	negligible	none	yes	1,2,5,6,7
05-05-54-113	indirect	camping	negligible	none	yes	1,2,5,6,7
05-05-54-121	indirect	camping	negligible	none	no	1,2,5,6,7
05-05-54-250	indirect	camping	negligible	none	yes	1,2,5,6,7

Site #	Type of Effect	Nature of Effect	Severity of Effect	Protection Mitigation	Defer Survey ?	Alt. #
05-05-54-327	indirect	camping	negligible	none	yes	1,2,5,6,7
05-05-54-384	indirect	camping	negligible	none	yes	1,2,5,6,7
05-05-54-385	indirect	camping	minor	monitor	yes	1,2,5,6,7
05-05-55-17	direct	camping/ improve-ments	minor	monitor	no	1,2,5,6,7
05-05-55-126	indirect	camping/ looting	minor	monitor	no	1,2,5,6,7
05-05-55-270	none	none	none	none	yes	1,2
05-05-55-271	indirect	looting	minor	monitor	yes	1,2
05-05-55-286	none	none	none	none	no	1,2,5,6,7
05-05-55-287	indirect	camping	negligible	none	no	1,2,5,6,7

Table CR-4. Historic properties associated with each alternative on east side other than adjacent to Juniper Flat open riding area

Site #	Type of Effect	Nature of Effect	Severity of Effect	Protection Mitigation	Defer Survey ?	Alt. #
05-05-57-42	direct/ indirect	rutting, erosion, camping, looting	minor	monitor	no	1,2,5,6,7
05-05-57-334	direct/ indirect	rutting, displace-ment	minor	monitor	no	1,2,4,5,6,7
05-05-57-190	direct/ indirect	rutting, camping	minor	monitor	no	1,2,7
05-05-57-200	direct/ indirect	erosion, looting, camping	minor	monitor	no	1,2,5,6,7
05-05-57-294	none	none	none	none	no	1,7
05-05-57-717	direct	rutting	minor	monitor	no	1,2,5,6,7
05-05-57-718	direct/ indirect	rutting, down-cutting, displace-ment	minor	monitor	no	1,2,5,6,7
05-05-57-663	direct/ indirect	rutting, erosion, down-cutting	minor	monitor	no	1,2,5,6,7
05-05-57-1548	direct/ indirect	rutting, erosion, camping	minor	monitor	no	1,2,5,6,7
05-05-57-1549	direct	rutting	minor	monitor	no	1,2
05-05-57-56	indirect	camping	negligible	none	no	1,2,5,6,7
05-05-57-1309	direct	rutting	negligible	none	no	1,2,5,6,7

Site #	Type of Effect	Nature of Effect	Severity of Effect	Protection Mitigation	Defer Survey ?	Alt. #
05-05-57-254	direct	rutting/ displace-ment	negligible	none	no	1,2,5,6,7
05-05-57-816	direct	rutting	negligible	none	no	1,2
05-05-57-585	none	none	none	none	no	1,2
05-05-57-1292	indirect	looting	negligible	none	no	1,2
05-05-57-640	direct/ indirect	erosion, looting, camping, rutting	minor/ negligible	monitor	no	1,2
05-05-57-1284	direct/ indirect	erosion, looting, camping, rutting	minor/ negligible	monitor	no	1,2
05-05-57-105	direct	rutting, displace-ment	minor	monitor	yes	1,2,4,5,6,7
05-05-57-348	direct	rutting	negligible	none	yes	1,2,5,6,7

Table CR-5. Historic properties adjacent to the Juniper Flat concentrated use or open riding area and alternative in which they would be affected

Site #	Type of Effect	Nature of Effect	Severity of Effect	Protection Mitigation	Defer Survey ?	Alt. #
05-05-57-675	indirect	rutting, erosion, looting	major	barrier & signing around open riding area	no	1[8]
05-05-57-676	indirect	rutting, erosion	major	barrier & signing around open riding area	no	1
05-05-57-1049	indirect	rutting, erosion	major	barrier & signing around open riding area	no	1
05-05-57-1208	indirect	rutting, erosion, looting	moderate	barrier &signing around open riding area	no	1
05-05-57-1209	indirect	rutting	minor	monitor	no	1
05-05-57-1210	indirect	rutting, looting	minor	monitor	no	1
05-05-57-1280	indirect	rutting, looting	minor	monitor	no	1
05-05-57-1283	indirect	rutting, looting	minor	monitor	no	1

Under all the action alternatives, the prohibition of cross-country motorized vehicle travel will provide protection to sites that were identified within the APE but were not associated with a route or area.

The effects of each alternative on (1) the degree to which integrity of historic property values is diminished, (2) the number of historic properties within unauthorized routes at risk from ongoing use, and (3) the average number of historic properties at risk from creation of new routes are displayed in Table 6.

[8] Although these sites would be affected only in Alternative 1, barriers and signing around the Juniper Flat open riding area would be mitigations applied to Alternatives 2, 5, 6, and 7.

Table CR-6. Comparison of the effects of alternatives on cultural resources

	Alt 1	Alt 2	Alt 3	Alt 4	Alt 5	Alt 6	Alt 7
Degree to which integrity of historic property values are diminished - low (# of sites with negligible effects)	25	25	0	0	20	20	19
Degree to which integrity of historic property values are diminished – low/medium (# of sites with minor effects)	26	22	0	2	15	15	16
Degree to which integrity of historic property values are diminished – medium (# of sites with moderate effects)	2	1	0	0	1	1	1
Degree to which integrity of historic property values are diminished – high (# of sites with major effects)	3	0	0	0	0	0	0
# of historic properties within unauthorized routes at risk from ongoing use	31 - 2,880[a]	23	0	2	16	16	17
Average # historic properties at risk if new routes or areas are created or added to NFTS	3,390	23	0	0	16	16	17

[a]Although 31sites are currently at risk, the total number of known sites on the 1.2 million acres open to motorized cross-country travel is 2,880 and all might possibly be affected in the future if Alternative 1 is implemented.

Compliance with the LRMP and Other Direction

Surveys have been conducted per the LRMP and all identified eligible sites will be protected and monitored as appropriate. Alternative 1 would comply with LRMP standards and guidelines for identified sites; however, since Alternative 1 would allow creation of new unauthorized routes that could potentially have unmitigated effects on an unknown number of historic properties, it is not likely to meet standards from the LRMP in the future. It would not comply with the Travel Management Rule which requires that National Forests prohibit cross-country motorized travel and restrict motorized use to designated roads, trails and areas.

All action alternatives comply with applicable standards and guidelines from the LRMP, but would require an amendment to the KNF LRMP to comply with the Travel Management Rule.

Alternative 3 would not require mitigation to comply with the Motorized Recreation PA which is the means by which this project complies with regulations for implementing Section 106 of the NHPA in California. Alternative 4 would only require monitoring. With appropriate mitigations (displayed in Tables 2 through 5), Alternatives 2, 5, 6 and 7 will comply with the

Motorized Recreation PA. For routes in Oregon, the KNF consulted with the Oregon SHPO on routes proposed for addition to the NFTS in action alternatives. The Oregon SHPO concurred with the KNF's determination of "no effect" for the proposed travel management undertaking on March 24, 2009. No new additions to the NFTS are proposed in Oregon in Alternative 7 which was developed after March 24, 2009. Therefore, all action alternatives are in compliance with NHPA Section 106 regulations for properties in Oregon.

Inventoried Roadless Areas and Roadless Characteristics

Introduction

Inventoried roadless areas (IRAs) were identified through the Roadless Area Review and Evaluation II (RARE II) process. The California Wilderness Bill (1984) designated wilderness areas in the state, and released undesignated roadless areas to other uses. The LRMP (1995) addressed the roadless areas and identified which portions had lost roadless character since passage of the bill. Since 1995, the Forest Service has managed roadless areas under several different directives. Current management direction (outlined below) requires that any proposed road construction in IRAs be approved by the Secretary of Agriculture.

The California Wilderness Coalition and The Wilderness Society has an interest in promoting roadless character within a number of citizen-inventoried roadless areas, which are lands immediately adjacent to existing wilderness, or within or adjacent to IRAs. There are 11 CIRAs identified on the KNF. The LRMP does not prohibit management activities that would affect roadless character in these areas. The Wilderness Society proposes that the KNF limit road-related activities in these areas to preserve their roadless character so that they may be considered in the future for additions to wilderness, or for management as backcountry or primitive areas. Effects on citizen-inventoried roadless areas (CIRAs) were addressed for this project.

Analysis Framework: Statute, Regulation, LRMP, and Other Direction

Direction relevant to the proposed action as it affects agency identified IRAs includes:

The National Forest Management Act (NFMA), and its implementing regulations, required the development of management prescriptions for definitive lands areas of national forests during the Forest planning process.

The Travel Management (TM) Rule does not cite IRAs specifically but requires local agency officials to consider minimization of conflicts among uses of National Forest System (NFS) lands.

Secretary of Agriculture's Memorandum 1042-154 (5/28/09) reserves to the Secretary decision-making authority over the construction and reconstruction of roads in inventoried roadless areas, except in emergency situations (authority redelegated to National Forest Supervisors in **USDA memorandum of 8/3/09**).

The Klamath National Forest Plan (LRMP) does not consider inventoried roadless areas as a separate management area, but did identify and consider 19 IRAs. The Record of Decision (ROD) does not address motorized use in these areas except in Research Natural Areas, the Backcountry Management Area, designated and recommended Wild Rivers, and the special

habitat area for the *Calochortus persistens* sensitive plant where such use is prohibited. The ROD for the LRMP states:

> "No new roads will be constructed within inventoried roadless areas in Key Watersheds [LRMP standard 6-23]. All other released roadless areas will be managed according to the direction of the management area in which they occur." (p.3)

> "Portions of 2 released roadless areas will maintain their roadless characteristics and be managed as the Backcountry Management Area. New road construction will not be permitted in inventoried roadless areas within Key Watersheds that have a roadless character…I determined that allocating released roadless areas for other multiple use needs such as habitat for Threatened and Endangered species, Late-Successional Reserves and timber production was a higher need than maintaining options for future wilderness or providing additional backcountry opportunities. Late-Successional Reserves allow for vegetative management to enhance late-successional habitat which is critical for many Threatened and Endangered Species and could not be provided under wilderness designation. Due to the more pressing needs of Threatened and Endangered species and to low projected demand for wilderness use on the Forest over the next 50 years relative to the current supply, I did not feel that additional wilderness recommendations were warranted." (p. 7)

Effects Analysis Methodology

This analysis focuses on how each alternative would affect roadless characteristics within IRAs and CIRAs on the Klamath National Forest. Roadless characteristics identified in the 2001 Roadless Area Conservation Rule include: (1) high quality or undisturbed soil, water, and air; (2) sources of public drinking water; (3) diversity of plant and animal communities; (4) habitat for threatened, endangered, proposed, candidate, and sensitive species and for those species dependent on large, undisturbed areas of land; (5) primitive (P), semi-primitive non-motorized (SPNM) and semi-primitive motorized (SPM) classes of dispersed recreation; (6) reference landscapes; (7) natural appearing landscapes with high scenic quality; (8) traditional cultural properties and sacred sites and, (9) other locally identified unique characteristics (66 FR 3245, Jan. 12, 2001). Extensive modification of or effects to roadless characteristics could affect an area's potential for inclusion in the Wilderness System at a later date.

Table IRA-1. Roadless characteristics and descriptions

Characteristics	Description
Soil, water and air resources	These three key resources are the foundation upon which other resource values and outputs depend. Healthy watersheds provide clean water for domestic, agricultural, and industrial uses; help maintain abundant and healthy fish and wildlife populations; and are the basis for many forms of outdoor recreation.
Sources of public drinking water	NFS lands contain watersheds that are important sources of public drinking water. Careful management of these watersheds is crucial in maintaining the flow of clean water to a growing population.
Diversity of plant and animal communities	Inventoried roadless areas may play a role in conserving native biodiversity by providing areas where nonnative invasive species are rare, uncommon, or absent.
Habitat for TES and species dependent on large undisturbed areas of land	Large undisturbed areas of land function as biological strongholds and refuges for many species.
Primitive, semi-primitive nonmotorized, and semi-primitive motorized classes of recreation	These areas often provide outstanding recreation opportunities such as hiking, camping, picnicking, wildlife viewing, hunting, fishing, cross-country skiing, and canoeing. While they may have many wilderness-like attributes, unlike wilderness, the use of mountain bikes and motorized vehicles is allowed.
Reference landscapes for research study or interpretation	The body of knowledge about the effects of management activities over long periods of time and on large landscapes is very limited. Reference landscapes can provide comparison areas for evaluation and monitoring. These areas provide a natural setting that may be useful as a comparison to study the effects of more intensely managed areas.
Landscape character and integrity	High quality scenery, especially scenery with natural-appearing landscapes, is a primary reason that people choose to recreate. In addition, quality scenery contributes directly to real estate values in neighboring communities and residential areas.
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. Sacred sites are places that have special religious significance to a group. Traditional cultural properties and sacred sites may be eligible for protection under the National Historic Preservation Act.

Direct effects on roadless characteristics can result from disturbance of soil and vegetation, or changes in habitats. Effects such as noise may be generated by activity on the route and affect roadless characteristics (such as primitive recreation opportunities) at a distance. Results from resource analyses in other sections of this chapter were used to inform the discussion of effects on roadless characteristics.

The potential for impacts to roadless areas was determined through a GIS analysis overlaying unauthorized routes on the map of inventoried roadless areas and citizen-inventoried roadless areas. Miles of routes were multiplied by 320 acres (representing a ½ mile buffer).

Assumptions Specific to the IRA Analysis

- Adding road miles in IRAs to the NFTS (even if the route already exists) is considered to be road construction (per the 2001 Roadless Rule).
- New road construction is restricted by the Secretary of Agriculture's memorandum 1042-154 (5/28/09) in IRAs but not in CIRAs.
- Since there has been no analysis to determine the extent to which the acres within CIRAs have retained roadless character, all acres within CIRAs are considered to currently have roadless characteristics.
- Effects of unauthorized routes on roadless characteristics occur both on the disturbed site (effects to soils and vegetation) and adjacent to the route (effects on primitive and semi-primitive nonmotorized classes of recreation, and landscape integrity, primarily scenery).
- Each mile of route = 2 acres of ground where roadless characteristics (effects on soil or vegetation) are foregone.
- Off-route effects (primarily sound) can extend for up to ½ mile on either side of the route. Sound is considered to affect the quality of primitive recreation experiences.

Data Sources

- GIS layers of unauthorized routes
- GIS layers of IRAs and CIRAs (submitted by The Wilderness Society)

Indicators

- Measurement indicators for this analysis are:
- Miles of unauthorized routes (Alternative 1) or miles of roads and trails proposed for addition to the NFTS within IRAs and CIRAs (action alternatives).
- Acres of IRA or CIRA where roadless characteristics could be affected by designation of routes.

Methodology by Action

1. Direct and indirect effects of the prohibition of cross-country motorized vehicle travel

Short-term timeframe: 1 year.

Long-term timeframe: 20 years.

Spatial boundary: The IRA and CIRA boundaries.

Methodology: GIS analysis.

Attempting to quantify where cross-country motorized travel would occur under the no action alternative (Alternative 1) is speculative, since it is impossible to predict exactly where, when, or how cross-country motorized use would occur.

2. Direct and indirect effects of adding facilities to the NFTS

Short-term timeframe: 1 year.

Long-term timeframe: 20 years.

Spatial boundary: The IRA and CIRA boundaries.

Methodology: GIS analysis.

3. Direct and indirect effects of changes to the existing NFTS

This action affects only roads that are currently on the NFTS. There will be no effects to roadless character from a change in vehicle type on existing roads. This action is not addressed further in this section.

4. Cumulative Effects

The greatest potential threats to maintaining roadless characteristics are road construction, reconstruction, and timber harvesting. These activities pose disproportionately greater risks of altering and fragmenting natural landscapes at regional and national scales (Federal Register, Volume 66, No. 9, pg. 3244). No ongoing or reasonably foreseeable vegetation management or road construction activities are proposed for IRAs or CIRAs on the Klamath National Forest, so cumulative effects will be the same as those described for direct and indirect effects.

Affected Environment

T here are 19 Inventoried Roadless Areas on the Klamath National Forest. The California Wilderness Act of 1984 released these areas to other uses, and since that time timber harvest and road construction activities have resulted in a loss of natural integrity or natural appearance on about 10% of the acres (Table IRA-2). Benefits from retaining roadless characteristics would apply to those portions of the IRAs that still retain roadless character. The LRMP does not prohibit off-road vehicle use in IRAs, and there are no Forest Orders in place that do so. About 4 miles of unauthorized routes occur within IRAs.

Table IRA-2. Unauthorized routes in inventoried roadless areas on the KNF

Inventoried Roadless Area	Acres	Acres no longer retaining roadless character [9]	Acres retaining roadless character	# / Miles of unauthorized routes	Acres Affected
Boulder	500	250	250		
Callahan Flow	2,000		2,000	2 / 0.9	576
Condrey Mtn.	3,100		3,100		
Crapo	1,500		1,500		
Grider	11,000		11,000		
Johnson	9,300	2,600	6,700		
Kangaroo	40,500		40,500		
Kelsey	3,000	2,600	400		
Mt. Hoffman	500		500	3 / 0.7	448
Muse	300		300		
Orleans Mtn.	48,730	7,000	41,730		
Portuguese	20,400	8,000	12,400		
Russian	16,800		16,800		
Shackleford	1,585		1,585		
Siskiyou	53,600		53,600	1 / 2.3	1,472
Snoozer	23,030	1,400	21,630		
Tom Martin	9,400	3,760			
Ukonom Ck.	900		900		
TOTALS	**246,045**	**25,610**	**220,435**	**6 / 3.9**	

The Callahan Flow and Mt. Hoffman IRAs are on the east edge of the Goosenest District; they are adjacent to roadless areas on the Modoc National Forest. Both areas have retained natural integrity and appearance. The Siskiyou IRA is made up of 5 parcels surrounding the Siskiyou Wilderness. Steep topography has limited off-road travel by vehicles, so all five parcels have retained natural integrity and appearance. The one identified route connects two ML2 roads in the Pony Peak area. None of the action alternatives proposed to add routes or open riding areas within IRAs to the NFTS.

Currently there are 45 unauthorized routes (4.4 miles) within CIRAs (Table IRA-3). The unauthorized routes within CIRAs are generally short (only 6 are longer than 0.1 mile). All are associated with ML2 roads, and provide access to dispersed recreation sites.

Table IRA-3. Citizen inventoried roadless areas with unauthorized routes (current situation)

Citizen's Inventoried Roadless Area	Acres	Unauthorized routes # / miles	Acres affected*	% of Total Acres
Siskiyou	42,827	3 / 1.59	1,018	2.4
China Mountain	4,451	4 / 0.19	122	2.7
Condrey Mountain	4,064	3 / 0.42	269	6.6
Marble Mountain	135,665	15 / 0.88	563	<1
Red Buttes	50,038	2 / 0.15	96	<1
Russian	32,440	1 / 0.09	58	<1
Tom Martin	16,624	1 / 0.02	13	<1
Trinity Alps	69,118	16 / 1.06	678	1
TOTAL:	**359,599**	**45 / 4.4**	**2,817**	

*** Number of acres potentially affected by vehicle noise (1/2 mile on either side of a route)**

[9] Figures from Appendix C – Released Roadless Areas, from Klamath NF LRMP.

Environmental Consequences

Alternative 1

Direct and indirect effects of the prohibition on cross-country motorized travel

Alternative 1 allows the continuation of motorized cross-country travel within IRAs and CIRAs. Because there is no way to know where a motorized vehicle might travel, all 220,435 acres in IRAs that currently retain roadless characteristics could be negatively affected by creation of new routes or disturbance from vehicles. Another 357,000 acres within CIRAs (those acres not currently adjacent to unauthorized routes) could potentially be affected. Over time, repeated cross-country motorized travel could result in new routes that have the appearance of roads. New unauthorized routes could negatively affect roadless characteristics through compaction of soils and removal of vegetation, which could remove or degrade wildlife or plant habitats, and create visual contrasts that could affect landscape character. Effects on reference landscapes could include changes in soil character, water runoff, habitat and landscape character, which could negatively affect research or study activities proposed for these areas. Sounds and sights of motor vehicles could affect the quality of primitive/semi-primitive nonomotorized recreational experiences. This alternative could also result in direct and indirect impacts to cultural resources exposed to vehicle use. There is no way to quantify the number of miles of new routes that could be created, or the number of acres that could be affected by route proliferation.

About 4 miles of existing unauthorized routes within IRAs and 4.4 miles within CIRAs would continue to be used under this alternative (Table IRA-3). Effects of these routes are considered to be minor at the Forest scale, although they can affect roadless character in the areas where they occur. Under this alternative, about 2,500 acres in IRAs and about 2,830 acres in CIRAs adjacent to these routes would continue to be subjected to noise, dust and physical intrusion by motorized vehicles. A minimum of 8 acres of plant and wildlife habitat in IRAs and 8.8 acres in CIRAs would be foregone in the long term.

Direct and indirect effects of adding facilities to the NFTS

This alternative does not add facilities to the NFTS so there are no direct or indirect effects.

Cumulative Effects

There are no ongoing or foreseeable road-related activities located within IRAs or CIRAs. The cumulative effects of this alternative are the same as the direct and indirect effects.

Alternative 2

Direct and indirect effects of the prohibition on cross-country motorized travel

Prohibiting cross-country travel would eliminate the potential for creation of new unauthorized routes in IRAs and CIRAs, with associated impacts to roadless characteristics. In the short term, until restoration occurs, 4 miles of unauthorized routes within IRAs and 0.54 mile within CIRAs will have the appearance of roads. Over time, soils will loosen, improving infiltration, and vegetation will grow on the disturbed portions of the routes, reducing visual contrasts; effects of these routes on roadless characteristics such as wildlife habitat and landscape integrity will diminish.

Direct and indirect effects of adding facilities to the NFTS

This alternative does not propose to add routes or open riding areas within IRAs to the NFTS; therefore, there are no effects on the roadless character of IRAs.

Alternative 2 proposes to add 3.86 miles in 36 routes (no riding areas) within CIRAs to the NFTS (Table IRA-4). Four routes are over 0.10 mile in length. All proposed routes branch off from existing ML 2 roads that will continue to be open for motorized vehicle travel. Roadless characteristics (primarily nonmotorized recreation opportunities) on approximately 2,470 acres could be negatively affected. About 7.5 acres of plant and wildlife habitat in CIRAs would be foregone in the long term.

Table IRA-4. Unauthorized routes within CIRAs proposed for addition to the NFTS by alternative.

CIRA	Alt 2	Alt 5	Alt 6	Alt 7
Siskiyou 42,827 acres	52-9 (.16) 52-9b (.06) 52-10 (1.37)	52-9b (.06) 52-10 (1.37)	52-9b (.06) 52-10 (1.37)	52-9b (.06) 52-10 (1.37)
SUBTOTAL	3 rts – 1.59 mi	2 rts – 1.43 mi	2 rts – 1.43 mi	2 rts – 1.43 mi
Red Buttes 50,038 acres	51-07 (.04) 51-28 (.11)	51-28 (.11) 51-28a (.03)	51-28 (.11)	51-28 (.11) 51-28a (.03)
SUBTOTAL	2 rts – 0.15 mi	2 rts – 0.14 mi	1 rt - 0.11 mi	2 rts – 0.14 mi
China Mtn 4,451 acres	55-78 (.09) 55-79 (.04) 55-80 (.01) 55-83 (.05)	55-78a (.01) 55-79 (.04) 55-80 (.01) 55-83 (.05)	55-79 (.04) 55-80 (.01) 55-83 (.05)	55-78a (.01) 55-79 (.04) 55-80 (.01) 55-83 (.05)
SUBTOTAL	4 rts – 0.19 mi	4 rts - 0.11 mi	3 rts – 0.1 mi	4 rts – 0.11 mi
Condrey Mtn 4,064 acres	51-09 (.29) 51-10 (.03) 51-11 (.10)	51-11 (.10) 51-11a (.13)	51-11 (.10) 51-11a (.13)	51-11 (.10) 51-11a (.13)
SUBTOTAL	3 rts – 0.42 mi	2 rts – 0.23 mi	2 rts – 0.23 mi	2 rts – 0.23 mi

CIRA	Alt 2	Alt 5	Alt 6	Alt 7
Marble Mountain 135,665 acres	51-36 (.09) 51-37 (.09) 51-38 (.02) 51-39 (.09) 54-05 (.09) 55-24 (.03) 55-26 (.04) 55-27 (.02) 55-28 (.03) 55-32 (.09)	51-38 (.02) 51-39a (.07) 55-26 (.04) 55-27 (.02) 55-28 (.03)	55-26 (.04) 55-27 (.02) 55-28 (.03)	51-38 (.02) 51-39a (.07) 55-28 (.03)
SUBTOTAL	10 rts – 0.59 mi	5 rts – 0.18 mi	3 rts – 0.09 mi	3 rts – 0.12 mi
Russian 32,440 acres	54-02 (.09)			
SUBTOTAL	1 rts – 0.09 mi			
Tom Martin 16,624 acres	51-41 (.02)	51-41a (.26)	51-41 (.02)	51-41 (0.02)
SUBTOTAL	1 rt – 0.02 mi	1 rt – 0.26 mi	1 rt – 0.02 mi	1 rt – 0.02 mi
Trinity Alps 69,118 acres	54-40 (.01) 54-42 (.09) 54-43 (.10) 54-49 (.04) 54-51 (.09) 54-52 (.03) 54-56 (.02) 54-57 (.13) 54-58 (.03) 54-61 (.09) 54-62 (.09) 54-63 (.09)	54-40 (.01) 54-43 (.10) 54-49 (.04) 54-52 (.03) 54-56 (.02) 54-57 (.13) 54-62 (.09)	54-40 (.01) 54-43 (.10) 54-49 (.04) 54-52 (.03) 54-56 (.02) 54-57 (.13) 54-58 (.03) 54-59 (.22) 54-62 (.09)	54-40 (.01) 54-43 (.10) 54-49 (.04) 54-52 (.03) 54-56 (.02) 54-57 (.13) 54-62 (.09)
SUBTOTAL	12 rts – 0.81 mi	9 rts – 0.42 mi	9 rts – 0.67 mi	9 rts – 0.42 mi
TOTAL - ALL	**36 rts – 3.86 mi 2,470 acres***	**25 rts – 2.77 mi 1,773 acres**	**21 rts – 2.65 mi 1,696 acres**	**25 rts – 2.47 mi 1,581 acres**

***Acres potentially affected by vehicle noise (1/2 mile on either side of route)**

Alternatives 3 and 4

Direct and indirect effects of the prohibition on cross-country motorized travel

Prohibiting cross-country travel would eliminate the potential for creation of new unauthorized routes in IRAs and CIRAs, with associated impacts to roadless characteristics. In the short term, until restoration occurs, 4 miles of unauthorized routes within IRAs and 4.4 miles of routes within CIRAs will have the appearance of roads. Over time, soils will loosen, improving infiltration, and vegetation will grow on the disturbed portions of the routes, reducing visual contrasts; effects of these routes on roadless characteristics such as wildlife habitat and landscape integrity will diminish.

Direct and indirect effects of adding facilities to the NFTS

Alternative 3 does not propose to add routes or open riding areas within IRAs or CIRAs to the NFTS, so there are no direct or indirect effects. Alternative 4 proposes one route (0.02 mile) in

the Marble Mountain CIRA to the NFTS; this would affect less than one acre of plant and wildlife habitat and 13 acres for noise disturbance. This level of effect is considered to be immeasurable for a CIRA of 135,000 acres.

Alternatives 5, 6 and 7

Alternatives 5, 6 and 7 do not propose to add routes or open riding areas within IRAs to the NFTS. They all propose to add routes, but not open riding areas, within CIRAs to the NFTS (Table IRA-4). Most of the proposed routes are short; only 4 are over 0.1 mile in length. All proposed routes branch off from existing ML 2 roads that will continue to be open for motorized vehicle travel. All are at the edges of CIRAs; none encroach further than 0.4 mile. The proposals are very similar, ranging from 2.47 to 2.77 miles. Roadless characteristics (primarily nonmotorized recreation opportunities) on approximately 1,581 to 1,773 acres could be negatively affected in the long term. About 7.5 acres of plant and wildlife habitat in CIRAs would be foregone in the long term.

Cumulative Effects for All Action Alternatives

Cumulative effects are the same as those described for direct and indirect effects since no ongoing or reasonably foreseeable actions are within IRAs or CIRAs.

Summary of Effects Across All Alternatives

Alternative 1 would continue to allow cross-country use in IRAs and CIRAs, and proliferation of routes could add to the 4 miles of unauthorized routes in IRAs and the 4.4 miles of unauthorized routes in CIRAs.

All action alternatives would prohibit cross-country motorized travel in IRAs. No authorized routes in IRAs would be added to the NFTS under any action alternative; effects of these alternatives on roadless character in IRAs are entirely beneficial.

All action alternatives would prohibit cross-country motorized travel in CIRAs, which would generate beneficial effects to roadless character on 356,782 acres. Alternatives 2, 5, 6 and 7 could negatively affect aspect of roadless character on 1,581 to 2,470 acres adjacent to routes in CIRAs. Wilderness potential on these acres (about 0.7% of the area within CIRAs available for future wilderness designation) would be negatively affected in the short and long term.

Table IRA-5. Summary of effects analysis across all alternatives

Indicator	Alt. 1	Alt. 2	Alt. 3	Alt. 4	Alt. 5	Alt. 6	Alt 7
Miles of unauthorized routes available for use in IRAs	43	0	0	0	0	0	0
Miles of unauthorized routes available for use in CIRAs	5.8	0	0	0	0	0	0

Indicator	Alt. 1	Alt. 2	Alt. 3	Alt. 4	Alt. 5	Alt. 6	Alt 7
Miles of routes added to NFTS within IRAs	0	0	0	0	0	0	0
Miles of routes added to NFTS within CIRAs	0	1.5	0	0	1.1	0.6	1.1
Acres of IRAs where roadless characteristics could be negatively affected	220,435	0	0	0	0	0	0
Acres of CIRAs where roadless characteristics could be negatively affected	359,599	2,470	0	13	1,773	1,696	1,581

Direct and indirect effects of the alternatives on roadless characteristics are summarized in Table IRA-6.

Table IRA-6. Summary of direct and indirect effects on roadless characteristics

Roadless Characteristics	Alt. 1	Alt. 2	Alt. 3	Alt. 4	Alt. 5	Alt. 6	Alt 7
Soil, Water & Air Resources	Negative	Beneficial	Beneficial	Beneficial	Beneficial	Beneficial	Beneficial
Sources of public drinking water	No Effect	No Effect	No Effect	No Effect	No Effect	No Effect	No Effect
Diversity of plant and animal communities	No Effect	No Effect	No Effect	No Effect	No Effect	No Effect	No Effect
Habitat for TES and species dependent on large undisturbed areas of land	Negative	Beneficial	Beneficial	Beneficial	Beneficial	Beneficial	Beneficial
Primitive and semi-primitive recreation opportunities	Negative	Beneficial	Beneficial	Beneficial	Beneficial	Beneficial	Beneficial
Reference landscapes for research study or interpretation	Negative	Beneficial	Beneficial	Beneficial	Beneficial	Beneficial	Beneficial
Landscape character and integrity	Negative	Beneficial	Beneficial	Beneficial	Beneficial	Beneficial	Beneficial
Traditional cultural properties and sacred sites	Negative	Beneficial	Beneficial	Beneficial	Beneficial	Beneficial	Beneficial

Table IRA-5. Comparison of effects on roadless characteristics.

Roadless Characteristics	Description of Effect
Soil, Water & Air Resources	**Alternative 1:** Traffic-generated sediment on 4 miles of routes in CIRAs will continue. There is a potential for new routes to be created. These routes would result in additional soil compaction and potential sedimentation which would negatively affect soil and water resources. **Action Alternatives:** Short term effects of cross-country travel prohibition will be an immediate reduction in fine sediment (<0.5mm diameter particle size) from running surfaces on up to 4.3 miles of unauthorized routes. Watersheds where routes would be added in CIRAs are currently healthy and that will not change through implementation of any action alternative. All routes not designated to be added to NFTS will, over the long term (>30 years), re-vegetate and regain a degree of soil productivity, assuming some remnant soil cover. Routes added to the NFTS would be dedicated to transportation uses and would not be subject to soil productivity standards. Effects on soil and water resources are considered to be beneficial.
Sources of public drinking water	There are no direct sources of public drinking water in CIRAs affected under any alternative.
Diversity of plant and animal communities	**Alternative 1:** The potential for route proliferation could adversely affect habitat for plant and wildlife species. There is no indication that this would negatively affect species diversity in either the short or long term. **Action Alternatives:** The Wildlife and Botanical Resources analyses do not indicate that there would be any negative impact to diversity of plant or animal communities.
Habitat for TES and species dependent on large undisturbed areas of land	**Alternative 1:** Routes that currently exist within habitat in IRAs CIRAs would continue to be unavailable in the long term, as unauthorized routes would be subject to repeated use. Additional effects on TES species could occur if new routes are created within important habitats in large undisturbed areas of land. However, the extent of this effect would be limited on the KNF because (1) topography on the west side of the KNF limits the extent of vehicle travel within large undisturbed areas, and (2) the east side of the KNF does not support any large undisturbed land areas. **Action Alternatives:** There would be beneficial effects on plant and wildlife habitats due to the prohibition of cross-country motorized travel on 220,435 acres (that retain roadless character) in IRAs on the KNF, and on about 356,000 acres of habitat within CIRAs.
Primitive and semi-primitive classes of recreation	**Alternative 1:** Recreation activities such as hiking, backpacking, fishing, and wildlife viewing would continue to be subject to noise, dust and physical intrusion by motor vehicles on 220,435 acres (that retain roadless character) in IRAs, and on about 356,000 acres within CIRAs. **Action Alternatives:** The prohibition of cross-country motorized travel would eliminate noise, dust and physical intrusion by motor vehicles, and enhance the experience for recreationists participating in non-motorized recreation activities on acres. Depending on the alternative, a maximum of 960 acres (.08% of the currently open land area) would continue to be affected by these factors. The action alternatives would have beneficial effects on opportunities for primitive and semi-primitive recreation.
Reference landscapes for research study or interpretation	**Alternative 1:** Existing unauthorized routes would continue to affect reference landscapes; new routes could be created and negatively affect reference landscapes. **Action Alternatives:** The routes proposed for addition to the NFTS are all short and associated with ML 2 roads. They do not intrude further than 0.4 mile into CIRAs, and do not present a substantial intrusion into reference landscapes. Prohibiting cross-country travel will reduce the opportunity of noise disturbance and habitat degradation, and will benefit the natural condition of the landscape.
Landscape character and integrity	**Alternative 1:** Currently, IRAs and CIRAs meet the Visual Quality Objectives for the KNF as stated in the LRMP. Landscape character and integrity might be negatively affected in the future through proliferation of unplanned routes. Current and predicted low levels of traffic on unauthorized routes make this less likely. **Action Alternatives:** None of the alternatives are anticipated to detract from the landscape character and integrity of CIRAs, as rugged terrain masks the visibility of existing routes and motorized use levels are light. Routes to be added to the NFTS are low standard, primitive, native surface routes that remain visually subordinate to the landscape by following natural terrain and contour.
Traditional cultural properties and sacred	**Alternative 1:** Creation of unplanned routes could affect cultural properties in the future. **Action Alternatives:** There are no identified Traditional Cultural Properties or sacred

Roadless Characteristics	Description of Effect
sites	sites on or near the routes proposed for addition within CIRAs. Consultation with local American Indian groups is ongoing to ensure the protection of, and access to, traditional secular, religious, and ceremonial sites. Elimination of unmanaged motorized travel into areas with spiritual values is considered to be a beneficial effect.

Compliance with the LRMP and Other Direction

Alternative 1 implements the Klamath National Forest LRMP, which allows cross-country motorized travel on all lands outside of Wilderness, Research Natural Areas, designated and recommended Wild Rivers, the *Calchortus persistens* Special Habitat Area, and Backcountry land allocations. The LRMP, as written, is not in compliance with the Travel Management Rule, and does not have any mechanism for protection of roadless characteristics in IRAs or CIRAs. Under this alternative, new unauthorized routes could be constructed within IRAs through unmanaged motorized use, which is inconsistent with direction in the ROD. The action alternatives all propose a Forest Plan amendment prohibiting motorized cross-country travel and would thereby comply with LRMP direction and the intent of the Secretary's Memorandum regarding protection of IRAs from creation of new unauthorized routes.

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Visual Resources

Introduction

This section of the Motorized Travel Management environmental analysis examines the extent to which alternatives respond to visual resources management direction established in the Klamath National Forest Land and Resource Management Plan (LRMP). The LRMP visual resources direction was established under the implementing regulations of the National Forest Management Act (NFMA).

In the development of the LRMP, the Forest's visual resources were inventoried to determine the landscape's scenic attractiveness (variety class inventory) and the public's visual expectations (sensitivity level inventory). Based upon these inventories, visual quality objectives (VQOs) were established for all forest land areas. The VQOs establish minimum acceptable thresholds for landscape alterations from an otherwise natural-appearing forest landscape. For example, areas with a Retention VQO are expected to retain a natural appearance; areas with a Partial Retention VQO may have some alterations, but they remain subordinate to the characteristic landscape; areas with a Modification or Maximum Modification VQO can have alterations that do not appear natural.

Roads and trails create linear alterations in landscapes that can be mitigated through sound design. Unmitigated, they present uncharacteristic line qualities in forest landscapes. Landscapes with a dense canopy cover have the capability of masking these linear alterations; sparsely covered landscapes have less capability. The proliferation of unauthorized routes, particularly in sparsely covered landscapes, can adversely affect the Forest's visual resources.

Analysis Framework: Statute, Regulation, LRMP, and Other Direction

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

National Forest Management Act (NFMA): The National Forest Management Act (NFMA), and its implementing regulations, required the inventory and evaluation of the Forest's visual resource, addressing the landscape's visual attractiveness and the public's visual expectations. Management prescriptions for definitive lands areas of the forest are to include visual quality objectives.

Travel Management Rule: The TM Rule does not cite aesthetics specifically, but in the designation of trails or areas the responsible official shall consider effects on forest resources, with the objective of minimizing effects of motor vehicle use.

Klamath National Forest Plan (LRMP): The LRMP contains direction for visual resource management, which is focused on conserving the natural scenic character of the Forest through

meeting the LRMP visual quality objectives (VQOs). Emphasis is on management of the visual resource seen from communities, high-use recreation areas and major roads and trails, conserving the inherent scenic attractiveness of distinctive landscapes, and rehabilitating areas not currently meeting VQOs (USDA Forest Service, 1995).

LRMP standards and guidelines that apply to travel management include:

11-1 The VQOs [Visual Quality Objectives] are minimum conditions to be achieved as soon as possible in all management areas and within 3 years for all VQOs except preservation and maximum modification, which must be met immediately.

11-4 Perpetuate the ecologically established landscape character when implementing management activities. Manage activities in accordance with VQOs to reflect the form, line, color, and texture of natural occurrences.

11-6 State Highways 3, 96, 97 and Interstate 5 are potential State scenic highways which will be managed to maintain their eligibility. Manage to meet a Retention VQO for foreground views in the viewshed, except for the BVNG [Butte Valley National Grassland] which will have a partial retention VQO for foreground views. Manage to meet a Partial Retention VQO for the middleground views in the viewshed.

11-8 Areas not visible from inventoried high or moderate sensitivity viewpoints (level 1 and 2) shall be managed to appear as little modified as possible consistent with management goals, and no more altered in appearance than maximum modification.

In addition to the forestwide standards and guidelines, each land allocation is assigned a VQO or a range of VQOs to guide decisions and resource management activities (a map showing VQOs by land allocation is included in the project files).

VQOs provide direction for visual resources to determine the level of acceptable change for the landscape and are established in the Klamath LRMP. This analysis uses VQOs to determine if the alternatives meet Forest Plan standards and guidelines by comparing the degree of alterations from an otherwise natural-appearing forest landscape. There are 5 defined VQO levels:

Preservation VQO – This VQO provides for ecological changes only (USDA Forest Service, 1995). Management activities, except for very low visual impact recreation facilities, are prohibited (USDA Forest Service, 1974).

Retention VQO – Activities are not evident to the casual forest visitor (USDA Forest Service, 1995). This VQO provides for management activities that are not visually evident. Under Retention, activities may only repeat form, line, color, and texture which are frequently found in the characteristic landscape (USDA Forest Service, 1974).

Partial Retention VQO – Activities may be evident but must remain subordinate to the characteristic landscape (USDA Forest Service, 1995). Activities may also introduce form, line, color, or texture which are found infrequently or not at all in the characteristic landscape, but they should remain subordinate to the visual strength of the characteristic landscape (USDA Forest Service, 1974).

Modification VQO – Activities may dominate, but must utilize naturally-established form and texture. These areas should appear natural when viewed in foreground or middleground situations (USDA Forest Service, 1995).

Maximum Modification VQO – Activities may dominate, but should appear as a natural occurrence when viewed in background situations (USDA Forest Service, 1995).

Unauthorized routes have been identified in lands covered by all of these VQO levels with the exception of the Preservation VQO (approximately 0.1 miles of unauthorized route is identified on a GIS based map as entering Preservation VQO; field review identifies that this is probably due to lack of identification of the boundary on the ground).

Effects Analysis Methodology

This analysis was completed using the Visual Management System (USDA Forest Service, 1974), which is outlined in Forest Service Manual 2380.

The proposed route additions have the potential to continue to affect the visual resource. Roads and trails can create changes to a naturally appearing landscape by introducing noticeable deviations to the characteristic form, line, color or texture of a landscape. Continuing to use these routes forgoes opportunities to remove them from the landscape. Non-characteristic line quality associated with routes added to the NFTS is the greatest impact to the visual resources from this project.

Assumptions Specific to the Visual Resource Analysis

- Routes proposed for addition to the NFTS are generally low impact roads or trails, which easily meet the modification or maximum modification VQO. These VQOs allow for activities, such as roads and trails, which dominate the characteristic landscape but utilize naturally-established form and texture.
- Routes on lands within Modification or Maximum Modification VQOs will not be analyzed because visual effects created by unauthorized routes comply with these VQOs.

- The prohibition of cross-country travel would have a beneficial effect on scenery because it will eliminate creation of unauthorized future routes with no consideration for scenery resources.
- Changing the road use or vehicle class on existing NFTS roads would have no effect on scenery.
- All ongoing and reasonably foreseeable actions will have a visual resource analysis, and comply with VQOs for the land allocations in which they occur.

Data Sources

- LRMP for distribution of VQOs and identification of key scenic viewsheds.
- Forest's National Visitor Use Monitoring (NVUM) report (2001) to determine the popularity of viewing scenery or driving for pleasure.
- Forest Service Handbook 462 – The Visual Management System.
- GIS for spatial data on unauthorized routes.

Indicators

- Miles of unauthorized routes that will not be added to the NFTS (and are, therefore, available for vegetative and visual recovery in the long term).
- Miles of existing unauthorized routes (for Alternative 1) or routes proposed for addition to the NFTS (for action alternatives) within the Retention and Partial Retention VQOs.
- Number of key viewsheds that are, or have the potential to be, affected by motorized vehicle travel. Key viewsheds are defined as areas visible from State Highways 3, 263, 96, and 97, and Interstate 5.

Methodology by Action

1. Direct and indirect effects of the prohibition of cross-country motorized vehicle travel

Impacts to visual resources from prohibiting cross-country motorized travel are primarily indirect and long-term. Indirect effects include (1) elimination of the potential for additional unauthorized routes on the landscape; and (2) eventual recovery of unauthorized routes not added to the NFTS, which will reduce the impacts of these routes on the visual resource.

Short-term timeframe: Not applicable; changes to the visual resource occurring from prohibiting cross-country motorized travel will only occur over the long term.

Long-term timeframe: 20 years, the approximate length of time for natural rehabilitation of unauthorized routes.

Spatial boundary: Forest.

Methodology: Representative routes were field reviewed to verify VQO compliance. ArcMap was used to analyze key viewshed locations and VQOs assigned to the area.

2. Direct and indirect effects of adding facilities to the NFTS

Short-term timeframe: 1 year. In the short term, until passive recovery of unauthorized routes not proposed for addition to the NFTS occurs, visual impacts are the same for all action alternatives.

Long-term timeframe: 20 years.

Spatial boundary: The "viewshed" (the area visible from a specified set of viewpoints) is the unit of spatial analysis when considering effects associated with additions to the NFTS.

Methodology: Representative routes were field reviewed to verify VQO compliance. ArcMap was used to analyze key viewshed locations and VQOs assigned to the area.

3. Changes to the existing NFTS.

Visual resources will not be affected by changing maintenance levels of NFTS roads from closed (ML 1) to open (ML 2), or by adding mixed use to ML 3 roads. This action will not be addressed further in this section.

4. Cumulative Effects

Short-term timeframe: Not applicable; cumulative effects analysis will be done only for the long-term time frame.

Long-term timeframe: 20 years, the approximate length of time for visual recovery of unused routes.

Spatial boundary: The viewshed.

Methodology: Key viewsheds were evaluated for the potential to be affected by the combined effects of unauthorized routes and ongoing and reasonably foreseeable future actions.

The cumulative effects analysis for scenery considers the impact of the alternatives when combined with ongoing and reasonably foreseeable management actions. Ongoing and reasonably foreseeable actions that may affect visual resources include vegetation management (harvest, thinning, and fuel reduction), recreation facility development, livestock grazing, mining,

and road construction or decommissioning. Several of these actions can decrease the vegetative cover adjacent to both NFTS roads and unauthorized routes; however, management actions include project design standards to meet VQOs that assure visual impacts will be short-lived. Long term impacts to visual resources are most likely to be generated by facilities (such as roads) that involve removal of vegetation and will remain on the landscape for a long period of time. Therefore, the cumulative effects analysis focuses on ongoing and foreseeable road-related actions that overlap with this project.

Affected Environment

Americans highly value scenery, or visual quality, within their National Forest. Natural appearing forests offer scenes, which are valued as recreational settings and living environments. Such settings contribute to the well-being of many individuals in today's complex and fast-paced society. Conservation of the naturally established scenic character of these settings is the primary goal of visual management on all national forests.

The Klamath National Forest's 1.7 million acres provide opportunities for a variety of recreational activities. Remoteness from large population centers provides opportunities for uncrowded recreational experiences. The Klamath National Forest is known for its vegetative and topographical diversity, ruggedness, and primitive character. An abundance of scenic river canyons, mountain crests, and pristine, undisturbed landscapes offer high-quality settings for a many types of recreation pursuits. Of the Forest's landscapes, 22 percent are classified as highly attractive. These landscapes occur in mountain ranges above 5,000 feet elevation, river canyons, large wet meadows, or other of the Forest's prominent geologic features. The majority of the Forest consists of mostly pleasing, yet common, landscapes located on moderately steep slopes and ridges or on fairly level terrain.

Forest landscapes have been altered by both human activities and by natural processes. Impacts from human activities are primarily the result of past logging, road building, and, to a lesser extent, mining activity. The effects of wildfires are also noticeable on the landscape. In the long-term, wildfires are positive elements that have contributed to the Forest's natural landscape character, patterns, and diversity. At present, 74 percent of the Forest has a natural appearance, while the remainder appears altered. Most of the strong visual contrasts occur either in the background distance zone or out of sight of major highways, trails, or recreation areas.

The Forest has a high proportion of lands with steep to moderately steep slopes and soil colors that can sharply contrast with its green forests and other more subtle vegetative patterns. Thus its overall capability to retain a natural appearance when altered is relatively low. Although roads and trails cause visual contrasts noticeable on the landscape, they often provide the platform for viewing scenery and other natural features. The top four activities by Forest visitors based on 2001 National Visitor Use Monitoring (NVUM) data were viewing natural features,

relaxing, viewing wildlife, and driving for pleasure. Viewing natural features was the most popular activity on the Forest with about 61 percent of Forest visitors participating in this activity. Driving for pleasure was the fourth most popular activity with about 27 percent of Forest visitors reporting participation in this activity (USDA Forest Service, 2001). The Recreation section of this chapter includes more information about NVUM results.

Use of off-highway vehicles occurs across the KNF, primarily on the existing road system. Popular concentrated off-road use areas are in Humbug on the Oak Knoll Ranger District on the west side of the KNF, and on the Goosenest Ranger District on the east side. Relatively little vehicle use occurs off-road on other KNF lands. However, there are 497 miles of identified unauthorized routes on the Forest. Although off-road traffic levels are low, it is likely that additional routes are being and will be created by vehicles traveling off roads. These routes are unplanned and may not conform to the assigned VQOs.

Visual impacts from off-highway vehicle use include unauthorized routes which often create linear alterations on the landscape and have the potential to be viewed by Forest visitors looking from locations other than on the unauthorized route or by Forest visitors traveling on the route itself. Routes, when viewed from other locations, have the potential to create negative visual impacts by introducing non-characteristic linear features on a non-linear landscape with color contrasts from exposed soils on the routes and high use areas. Due to topographic and vegetative screening, many of these deviations are not noticeable in key viewsheds from the identified travel routes. In most cases, the visual impact is a short duration view of a low impact unimproved road or trail intersecting the road or highway. These low impact intersections are generally not evident to the casual Forest visitor or, if they are evident, remain subordinate to the characteristic landscape. The deviations from the characteristic landscape caused by off-highway vehicle use are most noticeable to the person riding on the route itself.

Key viewsheds include areas viewed from five highways traversing the Forest (State Highways 3, 263, 96, and 97, and Interstate 5) that were identified by the State of California as eligible State Scenic Highways. Lands along these routes are managed with a Retention VQO, except for the Butte Valley National Grassland along Highway 97 which is managed with a Partial Retention VQO. Views from these key viewsheds will be analyzed for VQO compliance. No unauthorized inventoried routes are identified as sensitive viewpoints or key viewsheds. Thus, views from unauthorized routes will not be analyzed as to VQO compliance.

Unauthorized routes occur within land allocations in all 5 VQO levels, although less than 0.1 mile of route is mapped in the Preservation VQO (Table VR-1).

Table VR-3. Forest acres and mileage of inventoried unauthorized routes by visual quality objectives (National Forest System lands only)

Visual Quality Objective	Acres	Percent of total Forest acres	Mileage of inventoried unauthorized motorized routes
Preservation	389,000	23%	<0.1[10]
Retention	128,000	8%	41
Partial Retention	802,000	47%	240
Modification	248,000	15%	184
Maximum Modification	113,000	7%	32
Totals	**1,680,000**	**100%**	**497**

Environmental Consequences

Alternative 1

Direct and indirect effects of the prohibition of cross-country motorized vehicle travel

Under this alternative, cross-country motorized vehicle travel would not be prohibited. In the short term, due to topography and vegetation, existing unauthorized routes are not very noticeable, and comply with assigned VQOs.

Over the long term, about 41 miles of unauthorized routes in the Retention VQO, 240 miles in the Partial Retention VQO and 216 miles in the Modification/Maximum Modification VQOs would continue to be used and would not naturally re-vegetate, so visual impacts would persist over time. While these impacts are currently in compliance with VQOs, there is no way to know where additional unauthorized routes may be established. It is impossible to predict exactly where, when, or how cross-country motorized use would occur. Newly-created routes have the potential to impact Retention and Partial Retention VQO areas, which are managed as natural to near-natural appearing in character. In the short-term, due to topographic and vegetative screening, the uncharacteristic linear and color effects typically associated with cross-country motorized travel would not be noticeable in the key viewsheds identified for this analysis. However, visual impacts from cross-country motorized use may be noticeable in areas outside of these viewsheds. In the long term, the potential of new motorized cross-country routes developing in key viewsheds could increase. Cross-country motorized travel in areas with sparse vegetation could be more visible to Forest visitors and the uncharacteristic linear features and lighter colored exposed soils could have a negative effect on the visual resource. In most cases, uncharacteristic linear features seen on the landscape would not meet the Retention or Partial

[10] According to GIS data, one unauthorized route (39N70B.1) approaches and may enter the Trinity Alps Wilderness for less than 0.1 mile. This is the only unauthorized route in the Preservation VQO. The route is not proposed for addition to the NFTS in any action alternative.

Retention VQOs. In the long-term, the public would notice more impacts to visual resources from unauthorized routes.

Direct and indirect effects of adding facilities to the NFTS

No additions or changes to the existing NFTS would be made under this alternative so there would be no direct or indirect effects to scenery from these actions.

Cumulative Effects

Ongoing and foreseeable road-related actions have impacts similar to those of adding unauthorized roads to the NFTS. Road-related actions include the addition of 13 miles of ML1 roads and 26 miles of ML2 road to the NFTS, and removal of 50 miles of road (48 miles through decommissioning and 2 miles through conversion to a hiking trail). Removing roads from the NFTS generally results in a more natural appearing landscape in the long term. The effects of these actions are analyzed in separate environmental analyses that disclose the effects of each on visual quality. The analyses include appropriate project design features and mitigation that minimize the impact; all will comply with the VQOs for the land allocations in which they occur.

Alternative 2

Direct and indirect effects of the prohibition of cross-country motor vehicle travel

The effects of the prohibition of cross-country travel would not be noticeable in the short-term, as vegetative restoration of unauthorized routes would take longer than one year. Over time, the visual impact of 405 miles of unauthorized routes will decrease. Most unauthorized routes and their associated visual impacts are currently not noticeable due to topographic and vegetative screening. If unauthorized motorized routes intersect a road or highway, a short duration view of a low impact, unimproved route may be noticeable but complies with assigned VQOs.

The effects of this action on visual resources would result in a more natural-appearing landscape in the long term. Overall the landscape would have higher scenic integrity than currently exists, with less evidence of human activity.

Direct and indirect effects of adding facilities to the NFTS

Of the 92 miles of road and motorized trail proposed for addition to the NFTS in this alternative, about 1.5 miles of roads are proposed to be added in the Retention VQO, and 26.1 miles in the Partial Retention VQO. Where proposed route additions intersect the road or highway, views of a low impact, unimproved route may occur for short durations, but these intersections generally would not be noticeable to the casual Forest visitor. The visual effects from these proposed route additions meet the Retention and Partial Retention VQOs. The key viewsheds identified for this

analysis would not be affected by the proposed unauthorized route additions under this alternative.

Most of the strong visual contrasts would continue to occur either in the background distance zone, in areas not assigned Retention or Partial Retention VQO, or out of sight of major highways, trails, or recreation areas. No new, unplanned routes will be created, and 405 miles of existing unauthorized routes would revegetate and visually recover in the long term which would result in a more natural-appearing landscape. The majority of the Forest would continue to have a natural appearance, and the landscape will show less evidence of human activity over time.

This alternative proposes 65 acres for off-highway vehicle (OHV) travel, 5 acres in the Humbug Open Riding Area and 60 acres in the Juniper Flat Open Riding Area. These open riding areas would allow off-road motorized travel, resulting in uncharacteristic linear and color effects which would be especially noticeable from within the area itself. The Humbug area is located in the Maximum Modification VQO which allows these types of impacts. The Juniper Flat area is located in the Retention VQO due to its proximity to Highway 97. Juniper Flat is not visible from the identified key viewshed of Highway 97 because of topographic and vegetative screening. Designation of both of these areas would meet the assigned VQOs.

Cumulative effects

Ongoing and foreseeable road-related actions have impacts similar to those of adding unauthorized roads to the NFTS. Road-related actions include the addition of 13 miles of ML1 roads and 26 miles of ML2 roads to the NFTS, and removal of 50 miles of road (48 miles through decommissioning and 2 miles through conversion to a hiking trail). The projects that add roads to the NFTS will have an associated visual resource analysis, and will comply with the VQOs for the land allocations in which they occur. Removing roads from the NFTS generally results in a more natural appearing landscape in the long term. Adding these effects to the direct and indirect effects of Alternative 2 would not have a substantial effect on visual resources.

Alternative 3

Direct and indirect effects of the prohibition of cross-country motorized vehicle travel

The effects of the prohibition of cross-country travel would not be noticeable in the short-term, as vegetative restoration of unauthorized routes would take longer than one year. Over time, the visual impact of 497 miles of unauthorized routes will decrease. Most unauthorized routes and their associated visual impacts are currently not noticeable due to topographic and vegetative screening. If unauthorized motorized routes intersect a road or highway, a short duration view of a low impact, unimproved route may be noticeable but complies with assigned VQOs.

Most of the strong visual contrasts would continue to occur either in the background distance zone, in areas not assigned Retention or Partial Retention VQO, or out of sight of major highways, trails, or recreation areas. No new, unplanned routes will be created, and 497 miles of existing unauthorized routes would revegetate and visually recover in the long term which would result in a more natural-appearing landscape. The majority of the Forest would continue to have a natural appearance, and the landscape will show less evidence of human activity over time.

In the long term, the effects of this action on visual resources would result in a more natural-appearing landscape, with higher scenic integrity than currently exists and less evidence of human activity.

Direct and indirect effects of adding facilities to the NFTS

This alternative proposes no new additions to the NFTS.

Cumulative Effects

Because this alternative does not propose any additions to the NFTS, the cumulative effects are a result of the prohibition of cross-country motorized travel combined with the effects of ongoing and foreseeable actions. Ongoing and foreseeable road-related actions have impacts similar to those of adding unauthorized roads to the NFTS. Road-related actions include the addition of 13 miles of ML1 roads and 26 miles of ML2 roads to the NFTS, and removal of 50 miles of road (48 miles through decommissioning and 2 miles through conversion to a hiking trail). The projects that add roads to the NFTS will have an associated visual resource analysis, and will comply with the VQOs for the land allocations in which they occur. Removing roads from the NFTS generally results in a more natural appearing landscape in the long term. Adding these effects to the prohibition of cross-country would have a minimal effect on visual resources.

Alternative 4

Direct and indirect effects of the prohibition of cross-country motor vehicle travel

The effects of the prohibition of cross-country travel would not be noticeable in the short-term, as vegetative restoration of unauthorized routes would take longer than one year. Over time, the visual impact of 490 miles of unauthorized routes will decrease. Most unauthorized routes and their associated visual impacts are currently not noticeable due to topographic and vegetative screening. If unauthorized motorized routes intersect a road or highway, a short duration view of a low impact, unimproved route may be noticeable but complies with assigned VQOs.

Most of the strong visual contrasts would continue to occur either in the background distance zone, in areas not assigned Retention or Partial Retention VQO, or out of sight of major highways, trails, or recreation areas. No new, unplanned routes will be created, and 430 miles of

existing unauthorized routes would revegetate and visually recover in the long term which would result in a more natural-appearing landscape. The majority of the Forest would continue to have a natural appearance, and the landscape will show less evidence of human activity over time.

In the longterm, the effects of this action on visual resources would result in a more natural-appearing landscape. The landscape would have higher scenic integrity than currently exists, with less evidence of human activity.

Direct and indirect effects of adding facilities to the NFTS

Of the 7 miles of road and motorized trail proposed for addition to the NFTS in this alternative, this alternative proposes no additions in the Retention VQO, and 3.6 miles in the Partial Retention VQO. Where proposed route additions intersect the road or highway, views of a low impact, unimproved road or trail may occur for short durations, but these intersections generally would not be noticeable to the casual Forest visitor. The visual effects from these proposed route additions meet the Partial Retention VQO. The key viewsheds identified for this analysis would not be affected by the proposed unauthorized route additions under this alternative.

Cumulative effects

Ongoing and foreseeable road-related actions have impacts similar to those of adding unauthorized roads to the NFTS. Road-related actions include the addition of 13 miles of ML1 roads and 26 miles of ML2 roads to the NFTS, and removal of 50 miles of road (48 miles through decommissioning and 2 miles through conversion to a hiking trail). The projects that add roads to the NFTS will have an associated visual resource analysis, and will comply with the VQOs for the land allocations in which they occur. Removing roads from the NFTS generally results in a more natural appearing landscape in the long term. Adding these effects to the direct and indirect effects of Alternative 4 would not have a substantial effect on visual resources.

Alternative 5

Direct and indirect effects of the prohibition of cross-country motor vehicle travel

The effects of the prohibition of cross-country travel would not be noticeable in the short-term, as vegetative restoration of unauthorized routes would take longer than one year. Over time, the visual impact of 428 miles of unauthorized routes will decrease. Most unauthorized routes and their associated visual impacts are currently not noticeable due to topographic and vegetative screening. If unauthorized motorized routes intersect a road or highway, a short duration view of a low impact, unimproved route may be noticeable but complies with assigned VQOs.

Most of the strong visual contrasts would continue to occur either in the background distance zone, in areas not assigned Retention or Partial Retention VQO, or out of sight of major

highways, trails, or recreation areas. No new, unplanned routes will be created, and 368 miles of existing unauthorized routes would revegetate and visually recover in the long term which would result in a more natural-appearing landscape. The majority of the Forest would continue to have a natural appearance, and the landscape will show less evidence of human activity over time.

In the long term, the effects of this action on visual resources would result in a more natural-appearing landscape. The landscape would have higher scenic integrity than currently exists, with less evidence of human activity.

Direct and indirect effects of adding facilities to the NFTS

Of the 69 miles of unauthorized route proposed for addition to the NFTS, this alternative proposes to add about 7.9 miles roads in the Retention VQO, and 28.4 miles in the Partial Retention VQO. Where proposed route additions intersect the road or highway, views of a low impact, unimproved road or trail may occur for short durations, but these intersections generally would not be noticeable to the casual Forest visitor. The visual effects from these proposed route additions meet the Retention and Partial Retention VQOs. The key viewsheds identified for this analysis would not be affected by the proposed unauthorized route additions under this alternative.

This alternative proposes 53 acres for off-highway vehicle (OHV) travel; 5 acres in the Humbug Open Riding Area and 48 acres in the Juniper Flat Open Riding Area. Visual impacts of these open riding areas are described under Alternative 2.

Cumulative effects

The cumulative effects analysis for scenery considers the impact of the alternatives when combined with ongoing and reasonably foreseeable future actions. Ongoing and reasonably foreseeable future actions include vegetation management actions that may decrease the vegetative cover of roads and trails added to the NFTS in the short term. Although some of the ongoing and reasonably foreseeable vegetation management actions may overlap in space with newly designated NFTS roads and trails, vegetation management actions include project design standards to meet VQOs that assure visual impacts will be short-lived. Cumulative impacts would be within VQOs. Other ongoing or reasonably foreseeable actions that may overlap added roads and trails, such as recreation development, grazing, and mining, also include design standards to meet VQOs so cumulative impacts would be within VQOs.

Ongoing and foreseeable road-related actions have impacts similar to those of adding unauthorized roads to the NFTS. Road-related actions include the addition of 13 miles of ML1 roads and 26 miles of ML2 roads to the NFTS, and removal of 50 miles of road (48 miles through decommissioning and 2 miles through conversion to a hiking trail). The projects that add roads to the NFTS will have an associated visual resource analysis, and will comply with the VQOs for

the land allocations in which they occur. Removing roads from the NFTS generally results in a more natural appearing landscape in the long term. Adding these effects to the direct and indirect effects of Alternative 5 would not have a substantial effect on visual resources.

Alternative 6

Direct and indirect effects of the prohibition of cross-country motor vehicle travel

The effects of the prohibition of cross-country travel would not be noticeable in the short-term, as vegetative restoration of unauthorized routes would take longer than one year. Over time, the visual impact of 438 miles of unauthorized routes will decrease. Most unauthorized routes and their associated visual impacts are currently not noticeable due to topographic and vegetative screening. If unauthorized motorized routes intersect a road or highway, a short duration view of a low impact, unimproved route may be noticeable but complies with assigned VQOs.

Most of the strong visual contrasts would continue to occur either in the background distance zone, in areas not assigned Retention or Partial Retention VQO, or out of sight of major highways, trails, or recreation areas. No new, unplanned routes will be created, and 378 miles of existing unauthorized routes would revegetate and visually recover in the long term which would result in a more natural-appearing landscape. The majority of the Forest would continue to have a natural appearance, and the landscape will show less evidence of human activity over time.

In the long term, the effects of this action on visual resources would result in a more natural-appearing landscape. The landscape would have higher scenic integrity than currently exists, with less evidence of human activity.

Direct and indirect effects of adding facilities to the NFTS

Of the 59 miles of road and motorized trail proposed for addition to the NFTS in this alternative, this alternative proposes to add about 7.9 miles roads in the Retention VQO, and 27.2 miles in the Partial Retention VQO. Where proposed route additions intersect the road or highway, views of a low impact, unimproved road or trail may occur for short durations, but these intersections generally would not be noticeable to the casual Forest visitor. The visual effects from these proposed route additions meet the Retention and Partial Retention VQOs. The key viewsheds identified for this analysis would not be affected by the proposed unauthorized route additions under this alternative.

This alternative proposes 53 acres for off-highway vehicle (OHV) travel; 5 acres in the Humbug Open Riding Area and 48 acres in the Juniper Flat Open Riding Area. Visual impacts of these open riding areas are described under Alternative 2.

Cumulative Effects

Ongoing and foreseeable road-related actions have impacts similar to those of adding unauthorized roads to the NFTS. Road-related actions include the addition of 13 miles of ML1 roads and 26 miles of ML2 roads to the NFTS, and removal of 50 miles of road (48 miles through decommissioning and 2 miles through conversion to a hiking trail). The projects that add roads to the NFTS will have an associated visual resource analysis, and will comply with the VQOs for the land allocations in which they occur. Removing roads from the NFTS generally results in a more natural appearing landscape in the long term. Adding these effects to the direct and indirect effects of Alternative 6 would not have a substantial effect on visual resources.

Alternative 7

Direct and indirect effects of the prohibition of cross-country motor vehicle travel

The effects of the prohibition of cross-country travel would not be noticeable in the short-term, as vegetative restoration of unauthorized routes would take longer than one year. Over time, the visual impact of 423 miles of unauthorized routes will decrease. Most unauthorized routes and their associated visual impacts are currently not noticeable due to topographic and vegetative screening. If unauthorized motorized routes intersect a road or highway, a short duration view of a low impact, unimproved route may be noticeable but complies with assigned VQOs.

Most of the strong visual contrasts would continue to occur either in the background distance zone, in areas not assigned Retention or Partial Retention VQO, or out of sight of major highways, trails, or recreation areas. No new, unplanned routes will be created, and 358 miles of existing unauthorized routes would revegetate and visually recover in the long term which would result in a more natural-appearing landscape. The majority of the Forest would continue to have a natural appearance, and the landscape will show less evidence of human activity over time.

In the long term, the effects of this action on visual resources would result in a more natural-appearing landscape. The landscape would have higher scenic integrity than currently exists, with less evidence of human activity.

Direct and indirect effects of adding facilities to the NFTS

Of the 74 miles of road and motorized trail proposed for addition to the NFTS in this alternative, this alternative proposes to add about 7.9 miles roads in the Retention VQO, and 41 miles in the Partial Retention VQO. This increase in miles in the Partial Retention VQO is due to the addition of 12.8 miles of routes on the Butte Valley National Grasslands. Routes in the Grassland are not visible from Highway 97 due to vegetative screening and the flat terrain. These routes are not easily discerned from the higher elevation areas to the west due to distance and vegetation. Where proposed route additions intersect the road or highway, views of a low impact, unimproved road

or trail may occur for short durations, but these intersections generally would not be noticeable to the casual Forest visitor. The visual effects from these proposed route additions meet the Retention and Partial Retention VQOs. The key viewsheds identified for this analysis would not be affected by the proposed unauthorized route additions under this alternative.

This alternative proposes 53 acres for off-highway vehicle (OHV) travel; 5 acres in the Humbug Open Riding Area and 48 acres in the Juniper Flat Open Riding Area. Visual impacts of these open riding areas are described under Alternative 2.

Cumulative effects

Ongoing and foreseeable road-related actions have impacts similar to those of adding unauthorized roads to the NFTS. Road-related actions include the addition of 13 miles of ML1 roads and 26 miles of ML2 roads to the NFTS, and removal of 50 miles of road (48 miles through decommissioning and 2 miles through conversion to a hiking trail). The projects that add roads to the NFTS will have an associated visual resource analysis, and will comply with the VQOs for the land allocations in which they occur. Removing roads from the NFTS generally results in a more natural appearing landscape in the long term. Adding these effects to the direct and indirect effects of Alternative 7 would not have a substantial effect on visual resources.

Summary of Effects Across All Alternatives

All alternatives have the same minor effects on visual resources in the short term, until unauthorized routes not proposed for addition to the NFTS visually recover. Due to topography and vegetative screening, those effects are generally not noticeable. All action alternatives fall within the LRMP-designated VQOs. In the long term, for the action alternatives, routes not added to the NFTS will slowly revegetate and provide less contrast with surrounding vegetation. Although fewer acres will naturally revegetate in Alternatives 2, 5, 6, and 7 than in Alternatives 3 and 4, views from key viewsheds will continue to meet VQOs and not be negatively affected by routes or open riding areas added to the NFTS in these alternatives. Alternative 1 meets VQOs in the short-term, with the exception of less than 0.1 mile of unauthorized route that may intrude into the Trinity Alps Wilderness, but in the long-term this alternative allows proliferation of unplanned, unauthorized routes that could adversely affect visual resources. Table VR-2 compares the alternatives.

Table VR-2. Miles of unauthorized routes added to the NFTS in Retention and Partial Retention VQOs, and Miles of Visual Recovery by Alternative

Indicator	Miles by Alternative						
	Alt 1[a]	**Alt 2**	**Alt 3**	**Alt 4**	**Alt 5**	**Alt 6**	**Alt 7**
Miles of routes available for visual recovery in the long term	0	405	497	490	428	438	423
Total miles of routes in Retention & Partial Retention VQOs added to NFTS	281	27.6	0	3.6	36.3	35.1	49.1
Number of key viewsheds potentially affected by motor vehicle travel	1[b]	0	0	0	0	0	0

a - Alternative 1 includes all unauthorized routes.
b – The Highway 97 viewshed is the most likely to be affected by the proliferation of routes in this alternative. Highways 96 and 263 are not likely to be affected due to the difficulty in creating unauthorized routers on the steep terrain surrounding these highways. The viewsheds from Interstate 5 and Highway 3 are so far in the distance that unauthorized routes would be difficult to see, and visual resources would not be affected.

Compliance with the LRMP and Other Direction

Under Alternative 1, a short (0.1 mile) segment of route in Preservation VQO could continue to be used. In addition, Alternative 1 allows cross-country motorized travel, which could promote changes to the landscape in key viewsheds that may not comply with Retention and Partial Retention VQOs in the long term. Long-term, this alternative may not be in compliance with Visual Resource standards and guidelines in the LRMP.

All the action alternatives meet the Retention and Partial Retention VQOs as viewed from the travel routes identified as key viewsheds for this analysis and, therefore, meet LRMP standards and guidelines.

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Geological Resources

Introduction

Geological resources affect all aspects of National Forest System lands. Geology determines watershed morphology, soil types, and other essential aspects of National Forest System lands. Geological resources include caves, paleontological resources, geological special interest areas, mining and minerals, and ground water. Geological hazards can affect public safety on National Forest System lands. Hazards can include rock falls, debris flows, slope stability issues, mining-related hazards, and public health concerns.

Forest management activities can result in resource damage when the activity's location, design, construction, or implementation is not based on an understanding of geologic conditions and geomorphic processes.

Analysis Framework: Statute, Regulation, LRMP, and Other Direction

The following statutory authorities govern geologic resources and services activities essential to Forest Service programs:

Forest and Rangeland Renewable Resources Planning Act of August 17, 1974 (RPA) (88 Stat. 476; 16 U.S.C. 1600-1614) as Amended by National Forest Management Act of October 22, 1976 (90 Stat. 2949; 16 U.S.C. 1609). This act requires consideration of the geologic environment through the identification of hazardous conditions and the prevention of irreversible damages. The Secretary of Agriculture is required, in the development and maintenance of land management plans, to use a systematic interdisciplinary approach to achieve integrated consideration of physical, biological, economic, and other sciences.

Asbestos Airborne Toxic Control Measure (ATCM) for Surface Application: The ATCM rule was adopted by the California Air Resource Board (CARB) in 1990 and amended in 2000. The amendment lowered the asbestos content to 0.25 percent for asbestos-bearing ultramafic rock materials used for surfacing applications subjected to vehicular, pedestrian or non-pedestrian use, such as cycling and horseback riding. In remote areas the naturally occurring asbestos (NOA) content can be as high as 1% without concern.

Federal Cave Resources Protection Act of 1988 (102 Stat. 4546; 16 U.S.C. 4301 et seq). This act provides that Federal lands be managed to protect and maintain, to the extent practical, significant caves.

Region 5 Regional Forester's Direction on Naturally Occurring Asbestos issued February 11, 2009: The regional forester provided direction on addressing NOA on national forest lands in California. "Any land management decisions regarding NOA must be based on

sound data and analysis. According to EPA, the scientific assessment and identification of actual public health risks associated with NOA is a complex and time intensive process. Until such studies are performed, the Region will not have definitive information regarding actual employee and public health risks posed by NOA on national forest lands. Therefore, no decisions are being made or direction issued at this point in time to restrict or alter public access to and/or recreational use of the national forests." The letter further directs forests to make the public aware of the potential risk of NOA and its presence on national forest lands as well as guidance on how visitors can reduce their exposure to the substance.

Klamath National Forest Land and Resource Management Plan (LRMP): The KNF LRMP geology standards and guidelines provide a framework for the geologic resources and hazards evaluation and geologic report content.

1-6 Where existing roads and trails travel through asbestos-bearing formations or where roads are surfaced with asbestos-bearing aggregate, potential mitigations measures, such as road or trail relocation, closure, paving and watering, shall be considered to maintain public safety.

2-3 A geologic evaluation will be conducted for all projects involving ground- or vegetation-disturbing activities on potential unstable lands.

Effects Analysis Methodology

The effects analysis will focus on the methodology and indicators for addressing the direct and indirect effects of each of the three actions that make up the alternatives, and the cumulative effects of implementing an alternative including the effects of ongoing and reasonably foreseeable actions.

The term "landslide" refers to both large-scale events (toe slope failures and debris slides) as well as small-scale, localized earth movements. Large-scale events are unusual, and can be triggered by a number of factors. The type of landslide triggered by cross-country travel would most likely be a small-scale event involving slope or fill failures on routes with cut and fill features. While failure of an unauthorized route without cuts and fills is possible, it is unlikely. Effects of small-scale events are generally limited in both extent and duration. The routes considered in this analysis present landslide risks associated with small-scale events.

Assumptions Specific to the Geological Resource Analysis

- The stability of active landslides, toe zones, landslide deposits and inner gorges is sensitive to ground-disturbing activities, such as cross-country motorized travel, and to concentration of water from roads. Gouging and gullying on these sensitive areas due to motorized travel on the hillslopes and the road surfaces can concentrate water, increasing the landslide potential.

- Impacts from unauthorized routes are occurring currently as the routes are being used.
- Most of the unauthorized routes considered in this analysis were established through repeated use by motor vehicles and do not have cuts and fills.
- Unauthorized routes in the Humbug area are old mining or logging routes, and many have cuts and fills. These routes are in granitic soils, and may be on unstable land. They present the highest risk of landslides of the routes considered in this analysis.
- Routes on the east side of the Forest are not considered to present landslide risk.
- Road maintenance, especially on roads with cuts and fills, can reduce landslide risk. Maintenance activities (such as cleaning culverts and ditches) maintain drainage, keep water off road surfaces, and reduce the potential for failures of fills.
- Routes already on the landscape that pose a threat to slope stability will not fully recover; therefore, the impacts to slope stability will continue, at least in the short term. Altered hillslope hydrology due to re-routing of water by the existence of the road prism is an effect that will persist following the prohibition of motorized travel on existing unauthorized routes.
- Vegetation recovery will ultimately reduce, but not eliminate, the landslide potential in currently disturbed areas.
- The timeframes for this analysis are based on measurable changes in landslide potential in the Forest due to revegetation of disturbed areas. The short-term timeframe of 1-5 years is the amount of time it typically takes for vegetation of to become reestablished after a disturbance has been discontinued. At 5 years the root support from the vegetation begins to stabilize the ground and landslide potential begins to decrease measurably. The long-term timeframe of 50 years is based on revegetation by large trees, which provide significant root support to unstable land. This support substantially reduces the landslide potential of an unstable hillslope.
- Cross-country travel currently is allowed on 1.2 million acres; it is feasible and practicable on areas with slopes <35% that lie outside of wilderness and other land allocations that prohibit OHV use.
- All areas underlain by ultramafic bodies are considered to potentially contain naturally occurring asbestos unless testing indicates otherwise.
- The ramifications of the proposed action and alternatives are spread throughout the Forest. Therefore, the spatial scale of the analysis is the Forest boundary.

Data Sources

- Route inventories collected in Step 1 of Travel Management and associated tabular data sets.
- Forest bedrock geology and geomorphic mapping.
- Aerial photos.
- Anecdotal information documenting the time required for passive restoration of routes closed to motor vehicle traffic based on observations of KNF staff.

Indicators

Geologic changes occur not only over spans of geologic time, but also at observable intervals of time that can be monitored or measured. Geo-indicators have been developed by the International Union of Geological Sciences as high-resolution measures of short-term changes in the geologic environment, which are significant for environmental monitoring and assessment for use in environmental reporting and ecosystem management (FSM 2880.61, paragraph 2).

The following indicators will be used to compare the differences in geological effects between alternatives.

1. Slope Stability

Slope stability is a concern both in a route's role in potential landslides, and how a landslide will affect a route. Roads affect the hillslope hydrology and can concentrate surface runoff onto sensitive ground increasing the potential for landslides. Damage to routes as a direct or indirect result of slope instability is a potential physical hazard to an unsuspecting motorist. The sediment delivered to streams and hillslopes by landslide activity can be exacerbated by the presence and use of routes.

A preliminary analysis was performed to highlight areas that may have geological hazards. Areas of concern for slope stability are known active landslides, inner gorges and steep (greater than 65 percent) slopes, and sites underlain by granitic bedrock. On the KNF, these are areas that are prone to landslides when disturbed. This disturbance includes the change in hillslope hydrology by channeling water, and gullying that can result from driving on wet soils.

In alternatives that propose to add routes to the NFTS in areas with slope stability concerns, routes were assessed at the project level scale, using data collected from field evaluations and measurements.

2. Asbestos Hazard

Asbestiform minerals are naturally-occurring fibrous silicate minerals that are commonly associated with ultramafic rock, including serpentinite. Asbestos exposure has been associated with several forms of lung and esophagus diseases. In order for asbestos to be a public health issue it must be released as dust into the air and inhaled by a human. The greatest risk is an off-highway vehicle driving on a ground surface that contains asbestos and either generating dust, or following another vehicle that is doing so. This would most commonly occur on a straight segment of road where high speeds are possible (such as a mixed use road).

For this project, areas underlain by serpentinite or ultramafic rock, which may contain asbestos, were delineated at the scale of 1:24000. About 58,000 acres were identified and mapped. Unauthorized routes that were proposed for addition to the NFTS, and roads proposed for mixed use in these areas were further evaluated. All routes in ultramafic rock that were proposed for addition to the NFTS in all alternatives are short (<0.5 mile) spurs that access dispersed recreation sites. These are rough surfaced routes that are unsuitable for high vehicle speeds. Low vehicle speeds (less than 15 mph) will result in minimal dust. It was determined that the risk of exposure to asbestiform minerals (if present) on these routes was very low, and no further testing was conducted.

Roads proposed for mixed use would allow higher vehicle speeds that could result in significant amounts of dust. All thirteen routes proposed for mixed use that lie within ultramafic rock types were sampled and tested for presence of asbestos. Seven roads tested negative for presence of the mineral. Six roads tested positive: three <0.1%, one at 0.1%, and two at 0.4%. The most stringent California Air Resource Board suggestion for NOA on roads is that the surface material must contain less than 0.25% NOA. The Board suggests that in remote areas the NOA content can be as high as 1%. None of the samples exceeded the remote road guidelines. All the asbestiform minerals detected were chrysotile asbestos. Studies have shown that low exposures to the chrysotile form of the mineral do not present a detectable health risk. A detailed discussion of the testing and results is included in “Naturally Occurring Asbestos Sampling and Testing – Travel Management Analysis” (Bell, 2009) which is included in the project files.

3. Abandoned Mine Hazard

There is a potential physical hazard to the users of roads and trails in close proximity to abandoned and active mines. The primary hazard is a person or vehicle falling into a shaft or adit.

Routes within a 500 foot buffer of a known mine were considered to be affected by this geo-indicator and were analyzed at a project level. The project level analysis included open adits,

shafts, or other features that may pose a falling or asphyxiation hazard. Any risks associated with abandoned mines in close proximity to proposed routes will be mitigated on a site-specific basis.

The following three indicators were considered for this analysis but determined to be not applicable to this process:

Groundwater

Groundwater sensitive areas are areas within a municipal groundwater basin (California Department of Water Resources) or in zones of permeable rock (alluvial deposits, fault zones, young lava flows, and caves). The risk to groundwater quality by the addition of routes to the NFTS or changing the class of existing NFTS routes will have a negligible impact on water quality. Vehicle accidents are uncommon on NFTS routes, and any spills from a vehicle accident would likely be small amounts of automotive fluids. The primary issue of concern with open roads and groundwater is potential groundwater pollution as a result of large fluid spills such as overturned tanker trucks or large diesel spills from an accident. Any large spills of hazardous fluids initiate an emergency response from the Forest Service, California Department of Fish and Game, and other affected agencies with the purpose of immediate containment, control, and mitigation in order to minimize impacts to groundwater quality. Catastrophic spills are not considered to be an action related to this project, and their impacts cannot be meaningfully evaluated. In light of this, the impact to groundwater will not be addressed further in this analysis.

Unique Geologic Areas

Easier access to special interest areas, natural research areas and caves may increase the frequency of visits to the location. This in itself is not detrimental to the resource. However, increased access to unique geologic areas has the potential to increase vandalism in sensitive areas. There has been little to no notable damage to the resource thus far and none of the routes in the alternatives run through or to the unique geologic areas. Therefore, the risk to unique geologic areas from this project is considered to be minimal.

Paleontological Resources

There are sparse paleontological resources on the Forest. Radiolarian fossils in chert deposits are the most common fossils, although there are occasional fossils in the limestone bedrock. Plant fossils such as the Western White Pine bark molds at the Fourmile Hill Tree Molds Geologic Special Interest Area have been found in the Western Cascades. Pleistocene-age vertebrate fossils have been found in a few caves on the Forest. To date there has been little to no notable damage to the paleontological resources on the Forest, and in general the routes proposed in the

alternatives avoid potential fossil-bearing areas. Therefore, the risk of destruction of paleontological resources is minimal and will not be addressed further in this analysis.

Geology Resource Methodology by Action

1. Direct and indirect effects of the prohibition of cross-country motorized vehicle travel

Short-term timeframe: 1 – 5 years

Long-term timeframe: 50 years

Spatial boundary: Forest

Indicators: Acres of land on which motorized cross-country travel is allowed.

Methodology: GIS analysis of the acres affected by indicators.

2. Direct and indirect effects of adding facilities to the NFTS

Short-term timeframe: 1 – 5 years

Long-term timeframe: 50 years

Spatial boundary: Forest

Indicators: Miles of unauthorized routes open to motorized use (Alternative 1) or of unauthorized routes proposed for addition to the NFTS (in action alternatives) in areas identified as having unstable lands, asbestos or abandoned mine hazards.

Methodology: GIS analysis of unauthorized routes compared to GIS layers displaying unstable lands, asbestos or abandoned mine hazards.

3. Changes to the existing NFTS

Short-term timeframe: 1 - 5 years

Long-term timeframe: 50 years

Spatial boundary: Forest

Indicator: Miles of routes with changes that may affect indicators.

Methodology: GIS analysis of changed routes compared to GIS layers of indicators.

4. Cumulative effects

Short-term timeframe: not applicable; cumulative effects analysis will be done only for the long-term time frame.

Long-term timeframe: 50 years

Spatial boundary: Forest

Indicators: Miles of unauthorized routes being added to the NFTS in areas affected by the geo-indicators (unstable lands, asbestos or abandoned mine hazards).

Methodology: GIS analysis of unauthorized routes, changed routes and routes being added by present and future actions compared to GIS layers displaying identified geo-indicators.

Cumulative effects result from the incremental impact of an action when added to the effects of past, present, and reasonably foreseeable future actions. Past activities are considered part of the existing conditions and are discussed within the Affected Environment section.

Ongoing and foreseeable management activities affect geological resources primarily through channeling water or runoff. Vegetation management activities do not generally affect geological indicators except through activities such as construction or decommissioning of roads, which can cause landsliding or provide access to mine hazards, or changes in type of use on roads through ultramafic rock, which can expose the public to asbestos dust. Therefore, this analysis focuses on the cumulative effects of this project and any roads or trails proposed in ongoing or foreseeable management projects. Appendix B provides a list and description of ongoing and reasonably foreseeable road-related projects on the KNF.

Affected Environment

The KNF is easily separated geographically – and geologically – into the Klamath Mountains to the west and the Cascade Mountains on the east side of the Forest. The Klamath Mountains are dominated by a series of accreted terranes that have been folded and faulted into the rugged landscape. The Mesozoic and Paleozoic (200-500 million years old) rocks are composed of varying lithologies including metamorphosed volcanic and sedimentary rocks, limestone/marble, schist and ultramafic rock. There is a potential for naturally occurring asbestos hazard in the ultramafic rocks, specifically the landslide-prone serpentinite. Extensive granitic intrusion of the terranes occurred during the Jurassic Period (200 – 150 million years ago). The resulting contact metamorphism can produce asbestiform minerals. Areas underlain by granitic bedrock are highly erodible and dissected by drainage networks and relatively unstable lands. Landslides in the steep Klamath Mountains are common and often associated with roads.

The Cascade Mountains consist of Tertiary to Quaternary (30 million years ago to recent) volcanic rocks such as lava flows, tuffs, breccias, and volcaniclastic rocks. The terrain is significantly less rugged than the Klamath Mountains. There are two chains of volcanoes, one extending northward from Mount Shasta to Goosenest Mountain and Eagle Rock, and the other extending Northeast from Mount Shasta to Medicine Lake. Lava flows in Shasta Valley (Pluto Cave Basalt) and Butte Valley (Butte Valley Basalt) are important groundwater aquifers. Quaternary-aged north-trending faults, related to basin and range extension, occurring between Meiss Lake and Lower Klamath Lake create closed basins such as Butte Valley and Antelope Sink.

Use of unauthorized routes and cross-country travel is contributing to ground cover disturbance on the KNF. This is a concern primarily on the steeper western side of the Forest, and especially in the Humbug drainage. Humbug is located chiefly in granitic bedrock, with highly erodible soils. The area has a long history of resource use, including hard-rock mining, wildfire suppression (with an extensive system of firebreaks), and logging (including skid roads and artificial terraces created for reforestation purposes). The canyons are riddled with poorly-drained unauthorized routes, many of which are old cut and fills that are heavily gullied and have steep segments (20 percent grades). The majority of these routes are not proposed for addition to the NFTS. There is also evidence of soil displacement and erosion as a result of cross-country motorized travel (see Soils section).

There are 3,325 acres open to motorized cross-country travel on unstable lands on the west side of the Forest with 28 miles of unauthorized routes, some with cuts and fills. These constructed routes are concentrated in the Humbug area, where past mining and logging activities have resulted in routes with potential for small fill failures.

Forest geologists have identified about 58,000 acres of lands on the KNF that are underlain by ultramafic rock. Exposure to asbestos dust could occur on these acres.

Motorized access to abandoned mines may present public health and safety issues. There are 216 known abandoned mines in the area open to cross-country motorized travel on the KNF. These mines may include shafts, holes and adits that pose a collapse or falling hazard. Klamath National Forest personnel have identified 216 abandoned mines to date, with knowledge of the general location of many of these mines; however, most have not been identified on the ground. There may be additional shafts and adits that could pose a hazard as well. The U.S. Mine Safety and Health Administration reported that between 2003 and 2007 there were 29 fatalities (nationwide) as a result of motorized travel in mining areas. There have been no recent reported accidents related to abandoned mines on the Klamath National Forest.

Due to its popularity for motorized use, Humbug was surveyed for mines and several small earth workings were identified; no adits or shafts were found. Other historical mining areas on the

west side of the Forest present risks to recreationists who travel cross-country, as there is a risk of falling into unidentified shafts or pits.

Environmental Consequences

Alternative 1

Direct and indirect effects of the prohibition on cross country motorized vehicle travel

Cross-country motorized travel is not prohibited in this alternative, and use of unauthorized routes would not be restricted. This discussion centers on effects from continued off-road travel.

About 28 miles of unauthorized routes on unstable lands will continue to be available for motorized use. In addition, unmanaged travel on 3,325 acres of unstable lands can lead to creation of new routes, resulting in gullying that can channel water and destabilize slopes. This could increase the landslide potential for these areas.

Cross-country motorized travel allows for surface disturbance to occur on over 58,000 acres of ultramafic bedrock. Existing unauthorized routes underlain by serpentine or ultramafic bedrock (12 miles total) were not tested for presence of asbestiform minerals. Motorized vehicle users traveling at high speeds in areas of ultramafic rock (especially those in open vehicles such as motorcycles and ATVs) could be directly exposed to asbestos dust; however, most unauthorized routes in this rock type are short and rough-surfaced, so it is unlikely that vehicles could reach speeds sufficient to generate dust. The potential for exposure to asbestos dust is considered to be low.

There are 216 known abandoned mines in the area open to cross-country motorized travel on the KNF; most are not signed. About 18 miles of unauthorized routes are within 500 feet of known mines. These facilities present a hazard for OHV enthusiasts traveling off designated roads and trails.

Direct and indirect effects of adding facilities to the NFTS

No facilities would be added to the NFTS under this alternative.

Direct and indirect effects of changes to the existing NFTS

No changes to the NFTS are proposed under this alternative.

Cumulative effects

There are currently 28 miles of unauthorized routes through unstable lands. Ongoing and reasonably foreseeable road-related actions will not add any miles of routes to the NFTS, and remove 5.9 miles through decommissioning activities on unstable lands. Under the current

scenario, motorized cross-country travel may also occur on 3,325 acres of unstable land. Continued cross-country travel through unstable areas can result in new unauthorized routes that can concentrate surface runoff and increase landslide potential. There is no way to quantify the number or mileage of potential new routes in this acreage.

This alternative allows for the continued use of 12 miles of unauthorized routes through ultramafic rock, and unrestricted cross-country travel on about 58,000 acres of lands underlain by serpentine or ultramafic rock. Ongoing and reasonably foreseeable activities do not add any miles of unauthorized route and remove 2.8 miles in ultramafic rock from the NFTS.

Ongoing and reasonably foreseeable activities do not propose to add any routes within 500 feet of known mines.

Alternative 2

Direct and indirect effects of the prohibition on cross country motorized vehicle travel

This alternative closes 9 miles of unauthorized routes and 3,325 acres of unstable land to motorized cross-country travel. Prohibition of cross-country travel will eliminate the potential for creation of new routes, and allow passive recovery of routes not added to the NFTS. Disturbed areas will revegetate in the long term, reducing landslide potential on unstable lands.

There are 58,000 acres of land in serpentine or ultramafic bedrock that would be closed to cross-country motorized travel. These lands have not been tested for presence of asbestos, so it is unclear whether the prohibition of cross-country travel would decrease the public's exposure to asbestos dust.

Hazards related to abandoned mines would be greatly reduced because of the elimination of motorized travel in the areas of 216 known abandoned mines.

Direct and indirect effects of adding facilities to the NFTS

This alternative will add 19 miles of unauthorized routes in unstable lands to the NFTS. Routes proposed as roads have stable running surfaces and do not require active maintenance; no additional work will be required to bring them up to standard for designation as an ML2 road. Routes in the Humbug area on unstable lands will be designated as motorized trails; these routes will receive improvement work to correct drainage problems and improve tread. Over time, maintenance performed on motorized trails added to the NFTS could slightly reduce the risk of landslides.

Six miles of routes to be added to the NFTS are underlain by ultramafic rock. The rough surfacing on these routes will require low vehicle speeds (less than 15 mph), which reduces the potential for dust and risk of exposure to asbestiform minerals (if present). This alternative does

not add any routes within 500 feet of a known abandoned mine. The two open riding areas proposed for addition to the NFTS are not underlain by ultramafic rock, and do not contain any known abandoned mines. There are no effects on these geo-indicators.

Direct and indirect effects of changes to the existing NFTS

The addition of mixed use on routes through unstable lands should have no effect on landslide risk.

This alternative adds mixed use (allowing non-highway legal vehicle use) on 14 miles of NFTS roads in ultramafic rock. Based on asbestos test results, this change is not considered to represent a health risk to the public.

This alternative does not propose mixed use on routes within 500 feet of a known abandoned mine.

Cumulative Effects

This alternative will add 19 miles of unauthorized routes in unstable lands to the NFTS. Ongoing and foreseeable road-related actions will not add any miles of road to the NFTS, and remove 5.9 miles through decommissioning from unstable lands. The ongoing projects include mitigation measures that minimize impacts from road construction on landslide risk. Maintenance performed on motorized trails added to the NFTS could slightly reduce the risk of landslides. Landslide risk would slightly increase Forest-wide under this alternative.

This alternative adds 6 miles of routes to the NFTS, and allows 14 miles of mixed use in ultramafic rock. Ongoing and foreseeable actions remove 2.8 miles of roads in ultramafic rock from the NFTS. No testing for asbestiform minerals was conducted on the routes to be added to the NFTS because they are all roughly-graded, short spur routes that are not conducive to high speeds. Use of motorized vehicles on these routes should not generate dust. These changes are not considered to represent a health risk to the public.

This alternative does not propose to add any unauthorized routes to the NFTS within 500 feet of a known abandoned mine, and none will be added through ongoing or reasonably foreseeable future actions.

Alternative 3

Direct and indirect effects of the prohibition on cross country motorized vehicle travel

Effects of the prohibition of cross country travel are the same as discussed for Alternative 2, except that 28 miles of unauthorized routes in unstable lands will be closed to motorized use.

Beneficial effects include a reduction in landslide risk, decrease in exposure to asbestos dust, and reduction in risk of encountering abandoned mine hazards.

Direct and indirect effects of adding facilities to the NFTS

No facilities would be added to the NFTS under this alternative.

Direct and indirect effects of changes to the existing NFTS

No changes are made to type of vehicle used under this alternative.

Cumulative effects

This alternative will not add unauthorized routes in unstable lands. Ongoing and reasonably foreseeable future actions will not add any miles of road to the NFTS, and will remove 5.9 miles through decommissioning from unstable land. At a Forest level scale, the landslide risk will be decreased.

This alternative does not add routes to the NFTS. Ongoing and foreseeable road-related activities remove 2.8 miles of roads in ultramafic rock from the NFTS. There is no risk of asbestos dust exposure from either cross-country motorized travel or use of non-highway legal vehicles on ML3 roads under this alternative.

This alternative does not propose to add any routes to the NFTS within 500 feet of a known abandoned mine, and none will be added through ongoing or reasonably foreseeable future actions.

Alternative 4

Direct and indirect effects of the prohibition on cross country motor vehicle travel

Effects of the prohibition of cross country travel are the same as discussed for Alternative 3. Beneficial effects include a reduction in landslide risk, decrease in exposure to asbestos dust, and reduction in risk of encountering abandoned mine hazards.

Direct and indirect effects of adding facilities to the NFTS

No routes through ultramafic rock, on unstable lands, or within 500 feet of a known abandoned mine are added to the NFTS in this alternative. This activity does not affect the geo-indicators.

Direct and indirect effects of changes to the existing NFTS

The addition of mixed use on routes through unstable lands should have no effect on landslide risk.

This alternative adds mixed use on 14 miles of roads in ultramafic rock. Per asbestos test results, this change is not considered to represent a health risk to the public.

This alternative does not propose mixed use on routes within 500 feet of a known abandoned mine.

Cumulative effects

Ongoing and reasonably foreseeable future actions will not add any miles of road in unstable lands to the NFTS, and will remove 5.9 miles through decommissioning from unstable lands. This would result in a slight reduction in landslide risk Forest-wide.

This alternative does not add any uauthorized routes to the NFTS but adds 14 miles of mixed use on roads in ultramafic rock. Ongoing and foreseeable actions remove 2.8 miles from ultramafic rock on the NFTS. These changes are not considered to represent a health risk to the public.

This alternative does not propose to add any routes to the NFTS within 500 feet of a known abandoned mine, and none will be added through ongoing or reasonably foreseeable future actions.

Alternative 5

Direct and indirect effects of the prohibition on cross country motorized vehicle travel

Effects of the prohibition of cross country travel are the same as discussed for Alternative 2, except that 12 miles of unauthorized routes in unstable lands will be closed to motorized use. Beneficial effects include a reduction in landslide risk, decrease in exposure to asbestos dust, and reduction in risk of encountering abandoned mine hazards.

Direct and indirect effects of adding facilities to the NFTS

This alternative will add 16 miles of unauthorized routes in unstable lands to the NFTS. Routes proposed as roads have stable running surfaces and do not require active maintenance; no additional work will be required to bring them up to standard for designation as an ML2 road. Routes in the Humbug area on unstable lands will be designated as motorized trails; these routes will receive improvement work to correct drainage problems and improve tread. Over time, maintenance performed on motorized trails added to the NFTS could slightly reduce the risk of landslides.

Five miles of routes to be added to the NFTS are underlain by ultramafic rock. The rough surfacing on these routes will require low vehicle speeds (less than 15 mph), which reduces the potential for dust and risk of exposure to asbestiform minerals (if present). This alternative does

not add any routes within 500 feet of a known abandoned mine. The two open riding areas proposed for addition to the NFTS are not underlain by ultramafic rock, and do not contain any known abandoned mines. There are no effects on these geo-indicators.

Direct and indirect effects of changes to the existing NFTS

The addition of mixed use on routes through unstable lands should have no effect on landslide risk.

This alternative adds mixed use on 22 miles of roads in ultramafic rock. Per asbestos test results, this change is not considered to represent a health risk to the public.

This alternative does not propose mixed use on routes within 500 feet of a known abandoned mine.

Cumulative effects

This alternative will add 16 miles of unauthorized routes in unstable lands to the NFTS. Ongoing and reasonably foreseeable road-related actions will not add any miles of routes in unstable lands to the NFTS, and will remove 5.9 miles through decommissioning activities. The ongoing projects include mitigation measures that minimize impacts from road construction on landslide risk. Maintenance performed on routes added to the NFTS could slightly reduce the risk of landslides. Landslide risk Forest-wide would increase under this alternative.

This alternative adds 5 miles of routes to the NFTS and 22 miles of mixed use on roads in ultramafic rock. Ongoing and reasonably foreseeable actions remove 2.8 miles of roads in ultramafic rock. No testing for asbestiform minerals was conducted on the routes to be added to the NFTS because they are roughly-graded, short spur routes that are not conducive to high speeds. Use of motorized vehicles on these routes should not generate dust. These changes are not considered to represent a health risk to the public.

This alternative does not propose to add any routes to the NFTS within 500 feet of a known abandoned mine, and none will be added through ongoing or reasonably foreseeable future actions.

Alternative 6

Direct and indirect effects of the prohibition on cross country motor vehicle travel

Effects of the prohibition of cross country travel are the same as discussed for Alternative 5. Beneficial effects include a reduction in landslide risk, decrease in exposure to asbestos dust, and reduction in risk of encountering abandoned mine hazards.

Direct and indirect effects of adding facilities to the NFTS

This alternative will add 16 miles of unauthorized routes in unstable lands to the NFTS. Routes proposed as roads have stable running surfaces and are self-maintaining; no additional work will be required to bring them up to standard for designation as an ML2 road. Routes in the Humbug area on unstable lands will be designated as motorized trails; these routes will receive improvement work to correct drainage problems and improve tread. Over time, maintenance performed on motorized trails added to the NFTS could slightly reduce the risk of landslides.

Five miles of routes to be added to the NFTS are underlain by ultramafic rock. The rough surfacing on these routes will require low vehicle speeds (less than 15 mph), which reduces the potential for dust and risk of exposure to asbestiform minerals (if present). This alternative does not add any routes within 500 feet of a known abandoned mine. The two open riding areas proposed for addition to the NFTS are not underlain by ultramafic rock, and do not contain any known abandoned mines. There are no effects on these geo-indicators.

Direct and indirect effects of changes to the existing NFTS

The addition of mixed use on routes through unstable lands should have no effect on landslide risk.

This alternative adds mixed use on 9 miles of roads in ultramafic rock. Per asbestos test results, this change is not considered to represent a health risk to the public.

This alternative does not propose mixed use on routes within 500 feet of a known abandoned mine.

Cumulative effects

This alternative will add 16 miles of unauthorized routes in unstable lands. Ongoing and reasonably foreseeable road-related actions will not add any miles of routes to the NFTS, and will remove 6.9 miles through decommissioning from unstable lands. The ongoing projects include mitigation measures that minimize impacts from road construction on landslide risk. Over time, maintenance performed on routes added to the NFTS could slightly reduce the risk of landslides.

This alternative adds 5 miles of roads and 9 miles of mixed use on roads in ultramafic rock. Ongoing and reasonably foreseeable actions remove 2.8 miles in ultramafic rock on the NFTS, and 9 miles available for mixed use. No testing for asbestiform minerals was conducted on the routes to be added to the NFTS because they are roughly-graded, short spur routes that are not conducive to high speeds. Use of motorized vehicles on these routes should not generate dust. These changes are not considered to represent a health risk to the public.

This alternative does not propose to add any routes within 500 feet of a known abandoned mine, and none will be added through ongoing or reasonably foreseeable future actions.

Alternative 7

Direct and indirect effects of the prohibition on cross country motorized vehicle travel

Effects of the prohibition of cross country travel are the same as discussed for Alternative 5. Beneficial effects include a reduction in landslide risk, decrease in exposure to asbestos dust, and reduction in risk of encountering abandoned mine hazards.

Direct and indirect effects of adding facilities to the NFTS

This alternative will add 6 miles of unauthorized routes in unstable lands to the NFTS. Routes proposed as roads have stable running surfaces and do not require active maintenance; no additional work will be required to bring them up to standard for designation as an ML2 road. Routes in the Humbug area on unstable lands will be designated as motorized trails; these routes will receive improvement work to correct drainage problems and improve tread. Over time, maintenance performed on motorized trails added to the NFTS could slightly reduce the risk of landslides.

About 3 miles of routes to be added to the NFTS are underlain by ultramafic rock. The rough surfacing on these routes will require low vehicle speeds (less than 15 mph), which reduces the potential for dust and risk of exposure to asbestiform minerals (if present). This alternative does not add any routes within 500 feet of a known abandoned mine. The two open riding areas proposed for addition to the NFTS are not underlain by ultramafic rock, and do not contain any known abandoned mines. There are no effects on these geo-indicators.

Direct and indirect effects of changes to the existing NFTS

The addition of mixed use on routes through unstable lands should have no effect on landslide risk.

This alternative adds mixed use on 9 miles of roads in ultramafic rock. Per asbestos test results, this change is not considered to represent a health risk to the public.

This alternative does not propose mixed use on routes within 500 feet of a known abandoned mine.

Cumulative effects

This alternative will add 6 miles of unauthorized routes in unstable lands. Ongoing and foreseeable road-related actions will not add any miles of routes onto the NFTS, and will remove 5.9 miles through decommissioning on unstable lands. The ongoing projects include mitigation

measures that minimize impacts from road construction on landslide risk. Over time, maintenance performed on routes added to the NFTS could slightly reduce the risk of landslides.

This alternative adds 3 miles of roads and 9 miles of mixed use on roads in ultramafic rock. Ongoing and reasonably foreseeable actions remove 2.8 miles in ultramafic rock on the NFTS. No testing for asbestiform minerals was conducted on the routes to be added to the NFTS because they are roughly-graded, short spur routes that are not conducive to high speeds. Use of motorized vehicles on these routes should not generate dust. These changes are not considered to represent a health risk to the public.

This alternative does not propose to add any routes within 500 feet of a known abandoned mine, and none will be added throughongoing or reasonably foreseeable future actions.

Summary of Effects Across All Alternatives

The measurement indicators for slope stability, asbestos hazard, and abandoned mine hazard (Tables G-1, G-2 and G-3) were based on the number of miles of routes and acres affected by the geo-indicators for each alternative.

Table G-1. Acres open to cross-country motorized travel with geologic measurement indicators by alternative

		Alt 1	Alt 2	Alt 3	Alt 4	Alt 5	Alt 6	Alt 7
Geologic Hazards (acres)	Slope Stability	3,325	0	0	0	0	0	0
	Ultramafic Rock	58,390	0	0	0	0	0	0
	Abandoned Mines	3,895	0	0	0	0	0	0
Total Acres		**61,715**	**0**	**0**	**0**	**0**	**0**	**0**

Table G-2. Miles of unauthorized/proposed routes with geologic measurement indicators by alternative

		Alt 1	Alt 2	Alt 3	Alt 4	Alt 5	Alt 6	Alt 7
Geologic Hazards (miles)	Slope Stability	28	19	0	0	16	16	6
	Ultramafic Rock	12	6	0	0	5	5	3
	Abandoned Mines	2	0	0	0	0	0	0
Total Miles		**42**	**25**	**0**	**0**	**21**	**21**	**9**

Table G-3. Changes to the NFTS (addition of mixed use) with geologic measurement indicators by alternative

		Alt 1	Alt 2	Alt 3	Alt 4	Alt 5	Alt 6	Alt 7
Geologic Hazards (miles)	Slope Stability (No Effect)	0	8	0	9	23	8	8
	Ultramafic Rock	0	14	0	14	22	9	9
	Abandoned Mines	0	0	0	0	0	0	0
Total Miles		**0**	**22**	**0**	**23**	**45**	**17**	**17**

* Mixed use for Alternative 7 includes ML 3 roads converted to ML 2 that will now allow non-highway legal motor vehicles, as well as ML 3 roads that will allow non-highway legal motor vehicles.

Alternative 1 has the highest impact on geologic resources and hazards because it allows motorized cross-country travel (Table 4). It has the highest landslide potential, and risk exposure for both asbestos and mine hazards. Alternatives 3 and 4 have the lowest impacts on the three geo-indicators because they prohibit motorized cross-country travel and do not add routes that affect geo-indicators to the NFTS. Other action alternatives are similar in their effects.

Table G-4. Comparison of effects on geological resources

Alternative 1	This alternative has the highest potential for negative effects to both geological resources and the public. 3,325 acres of unstable lands will remain open for cross-country motorized use, increasing landslide potential. About 58,000 acres of lands underlain by ultramafic rock could expose the public to asbestos dust, although the risk is considered to be low. 3,895 acres (18 unauthorized routes) within 500' of 216 known abandoned mines would continue to be open for motorized travel, representing a safety hazard for the recreating public.
Alternative 2	The prohibition of cross-country motorized travel will eliminate the potential for creation of new routes on 3,325 acres of unstable lands. This prohibition coupled with maintenance work on 19 miles of unauthorized routes could slightly reduce landslide potential Forest-wide in the long term. Removal of motorized travel from 58,000 acres of lands underlain by ultramafic rock would eliminate a slight risk of exposure to asbestos dust. Designation of 6 miles of route and addition of mixed use on 14 miles of roads underlain by ultramafic rock is not considered to be a public health risk. Closure of 3,895 acres within 500' of 216 known mines will eliminate a potential safety hazard. Effects of this alternative on all geoindicators are considered to be beneficial.
Alternative 3	This alternative prohibits cross-country motorized travel and does not propose addition of new routes to the NFTS. Alternative 3 offers the greatest benefits for geological resources.

Alternative 4	This alternative prohibits cross-country motorized travel and adds no routes that affect any geologic indicators. Because the addition of mixed use does not affect slope stability and is not considered to be a public health risk, the impacts and benefits of Alternative 4 are considered to be identical to Alternative 3.
Alternative 5	The prohibition of cross-country motorized travel will eliminate the potential for creation of new routes on 3,325 acres of unstable lands. This prohibition coupled with maintenance work on 16 miles of unauthorized routes could slightly reduce landslide potential Forest-wide in the long term. Removal of motorized travel from 58,000 acres of lands underlain by ultramafic rock would eliminate a slight risk of exposure to asbestos dust. Designation of 5 miles of route and addition of mixed use on 22 miles of roads underlain by ultramafic rock is not considered to be a public health risk. Closure of 3,895 acres within 500' of 216 known mines will eliminate a potential safety hazard. Effects of this alternative on all the geo-indicators are considered to be beneficial.
Alternative 6	The prohibition of cross-country motorized travel will eliminate the potential for creation of new routes on 3,325 acres of unstable lands. This prohibition coupled with maintenance work on 16 miles of unauthorized routes could slightly reduce landslide potential Forest-wide in the long term. Removal of motorized travel from 58,000 acres of lands underlain by ultramafic rock would eliminate a slight risk of exposure to asbestos dust. Designation of 5 miles of routes and addition of mixed use on 9 miles of roads underlain by ultramafic rock is not considered to be a public health risk. Closure of 3,895 acres within 500' of 216 known mines will eliminate a potential safety hazard. Effects of this alternative on all the geo-indicators are considered to be beneficial.
Alternative 7	The prohibition of cross-country motorized travel will eliminate the potential for creation of new routes on 3,325 acres of unstable lands. This prohibition coupled with maintenance work on 6 miles of unauthorized routes could slightly reduce landslide potential Forest-wide in the long term. Removal of motorized travel from 58,000 acres of lands underlain by ultramafic rock would eliminate a slight risk of exposure to asbestos dust. Designation of 3 miles of route and addition of mixed use on 9 miles of roads underlain by ultramafic rock is not considered to be a public health risk. Closure of 3,895 acres within 500' of 216 known mines will eliminate a potential safety hazard. Effects of this alternative on all the geo-indicators are considered to be beneficial.

Compliance with the LRMP and Other Direction

Over time, Alternative 1 may not meet LRMP geologic standards and guidelines due to the potential creation of unauthorized routes, which could occur on unstable lands or in areas with asbestos hazard (although there is minimal risk expected from asbestos dust exposure). This alternative does not meet the requirements of the Travel Management Rule.

The action alternatives would meet applicable LRMP geologic standards and guidelines, and would comply with the Travel Management Rule through implementation of an LRMP amendment prohibiting cross-country motorized travel.

Air Resources

Introduction

This chapter examines existing air resources and any potential for the Motorized Travel Management project on the Klamath National Forest (KNF) to affect these resources. Air emissions are generally managed and analyzed spatially by air basins where topographic features delineate common air quality characteristics. Air quality conditions are largely determined by short- and long-term meteorological and climatic conditions.

Analysis Framework: Statute, Regulation, LRMP, and Other Direction

Direction relevant to the proposed action as it affects air quality includes:

Federal Clean Air Act (CAA) is the federal law passed in 1970, and last amended in 1990, (42 U.S.C. §7401 et seq.) which is the basis for national control of air pollution. The 1990 amendments to the Clean Air Act include a list of 189 pollutants identified as hazardous to human health. Asbestos is one of the pollutants included on the list.

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

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

California Clean Air Act (H&S §§ 39660 et seq.): California adopted the California Clean Air Act (CCAA) in 1988. The Act provides the basis for air quality planning and regulation in California independent of federal regulations, and establishes ambient air quality standards for the same criteria pollutants as the federal clean air legislation (CARB 2007). According to the technical advisory issued in July 2008 by the Office of Planning and Research for the State of California, all agencies should identify the nature and extent of exposure to naturally occurring asbestos (NOA) based on the project location and type of project being proposed.

California Air Resource Board Off-Road Recreational Vehicle Emissions Standards Rulemaking (California code of regulations § 2410-2415): In 1994, the CARB approved new

off-highway recreational vehicle regulations (since amended in 1998). The rulemaking established emission standards for off-highway vehicles (OHVs) including off-road motorcycles (dirt bikes) and all-terrain vehicles (ATVs) (CARB 2006). OHV registration became contingent on vehicle compliance to California emissions standards.

KNF Land and Resource Management Plan (LRMP): The LRMP includes the following applicable direction related to air quality management:

Program emphasis—maintain air quality consistent with legal requirements.

1-3 Implement BMPs [Best Management Practices] to meet air quality objectives.

5-1 Manage for air quality consistent with the Clean Air Act. Management activities also shall comply with the air quality standards established by the CARB and the Siskiyou County Air Pollution Control District in California or by the Oregon Department of Environmental Quality and the Oregon State Smoke Management Plan in Oregon.

Effects Analysis Methodology

The potential health hazards of asbestos dust posed by motorized use of roads underlain by ultramafic rock have been analyzed and disclosed in the Geology section of this chapter. The overall effects of dust on air quality will be addressed here.

Ozone is formed when hydrocarbons, released during the combustion of fossil fuels, react with nitrates in the presence of solar radiation. Ozone is a component of smog and is a common in areas with stagnant air such as valleys between mountain ranges. Ozone can result in chronic health effects if exposure to high levels is prolonged. Fine particle matter (PM2.5) can aggravate respiratory illnesses such as asthma and heart disease. Dust generated from motorized travel on unpaved routes and ground surfaces can contain a PM2.5 component. Changes to the current travel system on the Forest may change the concentration or the focus of these contaminants.

The release of “greenhouse gases” into the atmosphere is believed to be related to the warming trend of the earth’s climate (climate change). Some of these gases, carbon dioxide, methane, nitrous oxide, and hydrofluorocarbons, are incorporated into the climate change emission standards of the State of California. The standards, expressed in terms of “CO2-equivalent” emissions, taken into account the fact that different pollutants vary in the severity of their climate change impact. The Air Resource Board for the State has responsibility to establish emission levels to be met by 2020. Motor vehicle use will have an effect on meeting emission levels.

Vehicle travel is associated with an elevated risk in human-caused fires, which can put smoke into the air. A review of historic fire occurrence on the KNF was conducted to determine the potential effects of motorized routes on the risk of human-caused fires; this is available in the project record located at the KNF Supervisor's Office in Yreka, CA.

Assumptions Specific to the Air Quality Analysis

- The ramifications of the proposed action and alternatives are spread throughout the Forest. Therefore, the spatial scale of the analysis is the Forest boundary.
- Implementation of any alternative will not result in an increase in motor vehicle use on the KNF.

Data Sources

- Route inventories collected in Step 1 of Travel Management (as discussed in Chapter 1 of this FEIS) and associated tabular data sets.
- Air resources from the Siskiyou County Air Pollution Control District
- KNF fire history information

Indicators

- Miles of routes and acres of open riding area available for use by motorized vehicles that could put dust or greenhouse gases into the air.
- Risk of human-caused fires that could generate smoke associated with unauthorized routes.

Air Resources Methodology by Action

1. Direct and indirect effects of the prohibition of cross-country motorized vehicle travel

Short-term timeframe: 1 – 5 years

Long-term timeframe: 50 years

Spatial boundary: Forest

Indicator: (1) Miles of unauthorized route and acres open to cross-country travel, (2) fire risk.

Methodology: GIS analysis of the acres affected.

2. Direct and indirect effects of adding facilities to the NFTS

Short-term timeframe: 1 – 5 years

Long-term timeframe: 50 years

Spatial boundary: Forest

Indicators: (1) Miles of routes and acres of open riding area added to the NFTS, (2) fire risk.

Methodology: GIS analysis of unauthorized/proposed routes and riding areas.

3. Changes to the existing NFTS

The type of motorized vehicle used on the NFTS would make no difference in the amount of dust or particulate matter produced by vehicles, in greenhouse gas emissions or in fire risk. This action is not addressed further in this document.

4. Cumulative effects

Short-term timeframe: not applicable; cumulative effects analysis will be done only for the long-term time frame.

Long-term timeframe: 50 years

Spatial boundary: Forest

Indicators: Miles of routes added to the NFTS as roads or trails.

Methodology: GIS analysis of existing unauthorized routes and open riding areas.

Cumulative effects result from the incremental impact of an action when added to the effects of past, present, and reasonably foreseeable future management actions. Actions that could affect air quality include construction and use of roads and trails, and prescribed fire. Dust from vehicle use on roads is an ongoing and long term effect. Prescribed fire has the potential to generate a substantial amount of particulate matter; however, it is conducted in compliance with all state and county air quality requirements and produces localized, short term effects. There is no indication that prescribed burning contributes to a cumulative effects on air quality. Therefore, the cumulative effects analysis for air quality focuses on road-related projects that could generate dust over the long term.

Affected Environment

The Northeast Plateau Air Basin, in which the KNF is located, is comprised of three districts – (1) the Siskiyou County Air Pollution Control District (APCD), (2) the Modoc County APCD, and (3) the Lassen County APCD. The KNF is regulated by the Siskiyou County APCD. The National Ambient Air Quality Standards (NAAQS) were established by the Environmental Protection Agency for outdoor air, and are meant to protect public health and the environment from

contaminants. The entire Northeast Plateau Air Basin is classified as in attainment for NAAQS. In order for an air basin to reach NAAQS attainment status, the 8-hour ozone must be less than 0.075 parts per million (ppm) (annual mean) and the fine particle matter (PM2.5) must be less than 35.0 micrograms per cubic meter ($\mu g/m^3$) (annual mean). The Siskiyou County APCD is in attainment for ozone and PM2.5 according to the most recent annual data (2006). In 2006, the 8-hour ozone annual mean was 0.064 ppm and the PM2.5 annual mean was 22.0 $\mu g/m^3$ (Cox 2008).

A review of fire history for the KNF indicates that from 1907 to 2007, 73% of all ignitions on the Forest were caused by lightning. The number of human-caused fires each year has declined over time. Currently, in the area surrounding the 497 miles of unauthorized routes, the KNF experiences an average of 2 fires per year; in the past 20 years 87% of these have been lightning starts. Information on fire risk is included in the process paper "Effects on Fire Risk – KNF Travel Management Project", located in the project files in the KNF Supervisor's Office.

Environmental Consequences

Alternative 1

Direct and indirect effects of the prohibition of cross-country motorized vehicle travel

Cross-country motorized vehicle travel is not prohibited in this alternative. Use of motor vehicles off designated roads can increase the amount of bare soil due to soil displacement and damage to vegetation, thus creating more dust (and particulate matter) and adversely impacting air quality. Approximately 1.2 million acres are available for motor vehicle use; cross-country travel occurs or is likely to occur on at least 497 miles of unauthorized routes.

Some greenhouse gases are being emitted into the atmosphere from the motorized vehicles traveling off roads. However, since the amount of motorized vehicle use is low (see Transportation section), the level of emissions are also low. The Northeastern Plateau Air Basin is in attainment with the NAAQS for 8-hour ozone and fine particulate matter set by the Environmental Protection Agency, and will remain in attainment under this alternative. There would be no substantial adverse impacts to air quality from this alternative.

Most wildfires on the KNF are started by lightning. Historically, human-caused fires along the 497 miles of unauthorized routes comprise 13% of total fire starts, representing a low fire risk. Fire risk is not expected to increase substantially under this alternative.

Direct and indirect effects of adding facilities to the NFTS

No additions are being made to the NFTS so there are no direct or indirect effects from this action.

Direct and indirect effects of changes to the NFTS

No changes are being made to the NFTS; there are no effects from this action.

Cumulative effects

The minor effects to air quality and greenhouse gases from this alternative are not increased by the addition of the ongoing and reasonably foreseeable road actions (Appendix B). Addition of 26 miles of open roads to the NFTS in ongoing and reasonably foreseeable actions, and removal of 50 miles from the NFTS, may slightly change the distribution of traffic but will not change the amount of motorized use occurring on the KNF. There should be no substantial increase in dust or greenhouse gases. The Northeastern Plateau Air Basin will continue to be in attainment with the NAAQS for 8-hour ozone and fine particulate matter set by the Environmental Protection Agency.

Alternatives 2-7

Direct and indirect effects of prohibiting cross country motorized vehicle travel

Under these alternatives, motorized vehicle users would be redirected from the 1.2 million acres of lands currently open for off-road travel to designated NFTS road, trails and areas. There is no information available to suggest that the total number of vehicle miles traveled annually by Forest users will change under any of the alternatives; use will just be redistributed. As a result, no effects to air quality or greenhouse gas emissions are anticipated.

Direct and indirect effects of adding facilities to the NFTS

Action alternatives propose adding from 0 to 92 miles of routes to the NFTS and 0 to 65 acres of open riding area. None of the action alternatives propose adding routes or areas that are expected to result in a significant increase or change in concentration of use. None of the alternatives propose adding areas or routes located in federal (national) non-attainment areas for pm 2.5 and ozone 8-hour. Tailpipe emissions have been accounted for by CARB, suggesting that CARB has a program to regulate these emissions to achieve state implementation plan targets. The amount of vehicle use on the KNF is not expected to substantially increase or decrease as a result of implementing any of these alternatives (see Society, Culture and the Economy section), so there would be no substantial effect on the production of dust or greenhouse gases. The Northeastern Plateau Air Basin will continue to be in attainment with the NAAQS for 8-hour ozone and fine particulate matter set by the Environmental Protection Agency for any of these alternatives.

Fire risk was calculated for Alternative 2, which proposes to add the most routes to the NFTS and is therefore considered a worst-case scenario. Historical fire risk associated with these routes is a little higher over the last 20 years than for all the unauthorized routes considered in the no

action alternative, which indicates that these routes are more popular and receive more use than others. Even so, the fire risk for Alternative 2 was determined to be low. Fire risk from other action alternatives is expected to be as low, if not lower, than from Alternative 2.

Cumulative effects

The negligible effects to air quality and greenhouse gases from this alternative are not substantially increased by the addition of the ongoing and reasonably foreseeable road actions (Appendix B). The road actions would not substantially increase the dust or greenhouse gases. The Northeastern Plateau Air Basin will continue to be in attainment with the NAAQS for 8-hour ozone and fine particulate matter set by the Environmental Protection Agency.

Compliance with the LRMP and Other Direction

All alternatives comply with state and federal laws and with applicable Air Quality standards and guidelines of the LRMP. There are no Best Management Practices associated with air quality for this project.

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Soil Resources

Introduction

The soil resource provides many essential functions for National Forest System (NFS) lands. It sustains plant growth that provides forage, fiber, wildlife habitat, and watershed protection. It absorbs precipitation, stores water for plant growth, and gradually releases surplus water which attenuates runoff rates. It sustains microorganisms which recycle nutrients for continued plant growth. The primary focus for management of soils is retention of productivity in the long term.

Analysis Framework: Statute, Regulation, LRMP, and Other Direction

Direction relevant to the project as it affects the soil resource includes:

National Forest Management Act of 1976. Renewable Resource Program. "(C) recognize the fundamental need to protect and where appropriate, improve the quality of soil, water, and air resources."

National Soil Management Handbook. The Soil Management Handbook (USDA 1991) is a national soils handbook that defines soil productivity and components of soil productivity, establishes guidance for measuring soil productivity, and establishes thresholds to assist in forest planning.

Region 5 Soil Management Handbook Supplement. The Forest Service Region 5 Soil Management Handbook Supplement (R5 FSH Supplement 2509.18-95-1) establishes regional soil quality analysis standards. The Forest plan standards and guidelines for soil productivity closely follow regional standards. The analysis standards address three basic elements for the soil resource: (1) soil productivity (including soil loss, porosity, and organic matter), (2) soil hydrologic function, and (3) soil buffering capacity. The analysis standards are to be used for areas dedicated to growing vegetation. They are not applied to lands with other dedicated uses, such as developed campgrounds, administrative facilities or, in this case, the actual land surface authorized for travel by the public using various kinds of vehicles.

Regional Forester's Letter (dated Feb 5, 2007). This letter provided clarification to forest supervisors on the appropriate use of the R5 Soil Management Handbook Supplement (R5 FSH Supplement 2509.18-95-1). It states in part:

> Analysis or evaluation of soil condition is the intended use of the thresholds and indicators in R5 FSH Supplement 2509.18-95-1. They are not a set of mandatory standards or requirements. They should not be referred to as binding or mandatory

requirements in NEPA documents. Standards and guidelines in Forest Land and Resource Management Plans provide the relevant substantive standards to comply with NFMA.

The thresholds and indicators represent desired conditions for the soil resource. Utilization of the thresholds and indicators provides a consistent method to analyze, describe, and report on soil condition throughout the Region.

Klamath National Forest Land and Resource Management Plan (LRMP): The KNF LRMP soils standards and guidelines relevant to this project include:

3-1 Plan and implement land management activities to maintain or enhance soil productivity and stability.

3-2 With the exception of roads, permanent facilities or other projects that will permanently occupy a site, [specified] levels of total soil cover should be maintained…to reduce the potential of soil erosion.

Effects Analysis Methodology

Soil productivity is affected by soil type, cover, compaction, and displacement (erosion). Soil characteristics of texture, slope, and hydraulic conductivity are grouped by the Soil Resource Inventory (USDA Forest Service, 1990). The Inventory classifies Forest soils into Erosion Hazard Rating (EHR) categories, which are broad evaluations of a soil's susceptibility to erosion. The EHR categories are low, moderate, high and very high. Combinations of steep slopes, non-cohesiveness, and coarse texture (which promote erosion and degrade water holding capacity for plants) add to higher EHR ratings and make recovery of productivity in the long term problematic. A classification of high or very high indicates that these soils, once de-vegetated, will not recover quickly. On the KNF, an EHR of very high generally occurs on sandy soils derived from granitic bedrock on steep slopes. While High or Very High ratings can provide a relative gauge of the potential for soil displacement (movement of soil off the site which can end up as sediment in a stream), they are not indicative of soil movement or sedimentation issues on any specific route. They are a better guide for whether the route will recover soil productivity within the foreseeable future.

The potential for sedimentation reaching a stream is dependent on a site's connectivity to a stream channel (see Hydrology section of discussion of sediment impacts). While some unauthorized routes have evident gullying problems, others are stable and show no signs of surface damage. Routes with erosion concerns are identified, and mitigations would be implemented to reduce or eliminate the potential for sedimentation.

Effects of compaction on soil productivity are calculated on a management unit basis (Soil Quality Standards require that 15% or less of a unit be subjected to compaction resulting in detrimental impacts to soils). Application of this standard Forest-wide would not provide a meaningful result. Therefore, effects on soil productivity are presented as the number of acres (by alternative) where soil productivity would be foregone in the long term due to addition of a route to the NFTS.

Assumptions Specific to the Soil Resources Analysis

- Soil productivity is adversely affected by soil displacement, compaction and erosion.
- Soil productivity is considered lost on unauthorized routes when ongoing vehicle use maintains compaction and inhibits the growth of vegetation.
- Over the long term, where vehicle use of a route is discontinued, soils can regain productivity through natural recovery of soil porosity lost to compaction, and vegetative recovery.
- Short term effects on the soil resource will continue after the cross-country closure is in place.
- Revegetation of soils on unauthorized routes could require 30 years. Assumption is based on on-the-ground observations of recovery of closed roads on the Klamath National Forest by Tom Laurent, KNF Soil Scientist (personal communication).
- Recovery times for routes in soil types with high or very high EHRs are variable (depending on rainfall, and soil and compaction) but will generally be longer than for routes in other EHRs (at least 30 years, and probably longer).
- Effects to soils from ML1 roads are similar to those from ML2 roads.
- There is no difference in effects to soils from different types of vehicles using existing NFTS roads.
- Roads are administrative facilities and a dedicated use of soil for non-productive use. Land areas dedicated to trails or roads are not expected to meet soil productivity standards.
- Routes in High and Very High EHRs that are not added to the NFTS will not recover in either the short or long term (more than 30 years), although they may begin the recovery process during that period. Routes in these EHRs that are added to the NFTS will not begin to recover. In either case, soil productivity is considered to be lost in the long term.
- By definition, NFTS roads and trails and other areas not dedicated to growing vegetation are not considered activity areas to which the Regional soil standards should be applied. Therefore, any route or area brought into the NFTS by any alternative considered in this plan is not subject to standards of soil productivity.

Data Sources

- Route-specific data collected by Forest staff in the field; all routes included in action alternatives were field reviewed. The Humbug area received special consideration due to the proposal for numerous motorized trails in an area of granitic soils and high EHRs.
- GIS layers of unauthorized routes, transportation system, and soil resource inventory (which include attributes of ERH and parent geology).

Indicators

- Miles of unauthorized routes (Alternative 1) or routes proposed for addition to the NFTS (action alternatives) in each of the R5 EHR ratings.
- Acres that will recover passively through implementation of the alternative (restoration of soil productivity in the long term).
- All indicators were used for all actions.

Methodology by Action

1. Direct and indirect effects of the prohibition of cross-country motorized vehicle travel.

Short-term timeframe: 1 year.

Long-term timeframe: 30 years.

Spatial boundary: Forest

Methodology: GIS analysis of route and EHR layers.

2. Direct and Indirect effects of adding facilities to the NFTS

Short-term timeframe: 1 year.

Long-term timeframe: 30 years.

Spatial boundary: Forest.

Methodology: GIS analysis of route and EHR layers.

3. Changes to the existing NFTS

Changes in type of vehicle use on existing roads are not considered to have any impact on the soil resource. This action will not be addressed further in this section.

4. Cumulative Effects

Short-term timeframe: not applicable; cumulative effects analysis will be done only for the long-term time frame.

Long-term timeframe: 30 years

Spatial boundary: Forest.

Methodology: Utilize observations and understanding of short-term effects to soil productivity to estimate long-term expected cumulative effects on soil productivity.

Cumulative effects result from the incremental impact of an action when added to the effects of past, present, and reasonably foreseeable future actions. Past activities are considered part of the existing conditions and are discussed in the Affected Environment section.

The ongoing and foreseeable projects that could affect soil conditions include vegetation management projects utilizing heavy equipment (such as loaders or chippers) that can compact soils, or road construction/decommissioning. Compliance with soil quality standards for these types of activities is assessed on a unit-by-unit basis; each unit must meet the 15% disturbance threshold. Cumulative effects would involve analysis of each management unit that includes an unauthorized route. At this time, there are no ongoing or reasonably foreseeable projects that include unauthorized routes within management unit boundaries, so there would be no additive effects between those activities and this project.

Effects to soils from road construction or decommissioning projects would be similar to the types of effects analyzed in this project. Therefore, cumulative effects for the soils resource are considered to be the combined long term effects on soil productivity from addition of routes to, and deletion of routes from, the NFTS.

Affected Environment/Environmental Consequences

Affected Environment

The soils on the Forest are variable due to differences in parent material, climate, topography, biology and age. Soils on the west side of the Forest have developed in colluvium and residuum from granitic and metasedimentary rock. These soils are moderately deep to deep (24-60+ inches). Soils on the east side of the Forest have developed primarily from volcanic ash deposited over lava flows. Soils are generally moderately deep to very deep (24-60+ inches). Surface soil textures are gravelly coarse sandy loams overlying gravelly, cobbly or very cobbly sandy loam subsoil.

Parent rocks of concern are plutonic (granitics), ultramafics (peridotite and serpentinite) and Condrey Mountain Schist (CMS). Soils derived from granitics are mostly non-cohesive and are easily eroded by rilling and gulling when runoff water is concentrated. These soil textures are primarily sandy loams with three to eight percent clay. The CMS soils are sandy loam to silt loam textures, non-cohesive, and easily eroded. Ultramafic soils have higher clay content than the others, which make them prone to deformation or rutting when wet. Other soil types, such as those formed from metasediments or volcanic ash, are not considered as a concern due to greater soil cohesion and higher rock fragment content, which make them more stable as a travel surface.

Most (1.2 million acres) of the Klamath National Forest is open to off-highway vehicle use. About 508,000 acres are lands less than 35 percent slope where use of off-road vehicles is practicable. Off-road vehicle use can result in soil displacement and compaction on any of these acres. Most use is currently concentrated on the 497 miles of user-created routes, which are compacted and mostly bare of vegetation. Outside the Humbug area, the routes proposed for addition to the NFTS are mainly on slopes of less than 35%, have compacted surfaces, have been in place for many years, and are self-maintaining (i.e. running surfaces do not require maintenance).

Slope gradient, along with ground cover, are the most important factors determining the potential for soil erosion. The west side of the Forest has much steeper terrain than the east side, leading to more miles of routes with higher Erosion Hazard Ratings. About 20% of the Forest is classified with an EHR of very high, 45% as high, 28% as moderate, and 7% as low. Of the 497 miles of unauthorized routes on the Forest, around 32% are in high and 14% are in very high EHR categories (Table SR-4). Approximately 7% (37 miles) of the unauthorized routes fall into areas that do not have soil map coverage; therefore, the total number of miles for each alternative does not match the number listed in the alternative description.

Table SR-4. Miles of unauthorized routes (Alternative 1) or routes proposed for designation to the NFTS (action alternatives) in each EHR. All values are miles. Some miles do not have soil map coverage and therefore no assigned EHR.

Alternative	Erosion Hazard Rating					Totals
	Low	Moderate	High	Very High	No map coverage	
1	20.4	211.6	160.3	68.0	36.7	497
2	2.8	48.7	18.0	17.8	4.7	92
3	0	0	0	0	0	0
4	0.0	6.2	0.8	0.0	0	7
5	3.7	29.5	17.1	17.5	1.2	69
6	3.1	28.3	15.7	8.5	3.4	59
7	16.5	27.2	16.7	12.6	1.0	74

Drainage is not a problem on the coarse, porous volcanic soils on the east side of the Forest. On the west side, soils most sensitive to water erosion are loose sandy and silty soils without

ground cover. Erosion is greatest where runoff is concentrated and runoff dispersion features are lacking. Most erosion problems observed were on the steeper portions of routes (generally over 35% slope). Roads that have been closed due to natural events showed very little erosion, due mainly to high levels of soil cover from needle cast. OHV trails on ridges have a high occurrence of rills and gullies; intensity of gullying was highest for those long ridges that had no water dispersion features, and higher levels of motorized use. Most unauthorized routes in areas with High and Very High EHRs would not be expected to recover within 30 years; in a few cases, where a route is on a steep slope and soil loss is significant, the process of recovery may take many decades to centuries. However, it is assumed that the recovery process may begin once vehicle use is removed.

The Humbug drainage has soils derived primarily from granitic bedrock, which are highly erodible. Most of the unauthorized routes in High or Very High EHRs are in this drainage. Humbug has a high route density due to its long history of occupation and resource extraction. The area has been mined off and on since the mid-1800s, and many of the unauthorized routes originally accessed mine adits, shafts, or living sites. Many more routes were constructed for reforestation or restoration efforts after the Haystack Fire of 1955. Some routes were built using machinery, and show evidence of cutbanks or ditches. OHV riders using these routes tend to avoid the small gullies, leading to widening of the routes, resulting in additional soil compaction and displacement. Because of the soil type, and because most of the routes being considered are in High or Very High EHRs, routes in the Humbug drainage were field reviewed by both a hydrologist and soil scientist.

During the alternative development phase, most routes on steep slopes, or those with erosion concerns, were dropped from consideration in an alternative (see Chapter 2). Most of the routes considered in this analysis are not engineered roads; that is, they have not been designed but have been created through repeated vehicle travel on relatively gentle slopes. Site visits have confirmed that most have been hardened through use, and running surfaces are generally stable and self-maintaining. Much of the mileage proposed for addition to the NFTS consists of relatively short, rough-surfaced routes that access dispersed recreation sites. Routes proposed for designation as ML2 roads that cross perennial streams will require rocking (Table SR-2). None of the other routes proposed as ML2 roads will require improvement work to meet Road Management Objectives.

Some routes proposed for addition as motorized trails will require improvement work prior to being available for public use. With one exception (a crossing in Long John Creek), these routes are all located in the Humbug drainage. These routes were included in the action alternatives to provide a diversity of motorized experience (such as motorcycle trails). Approximately 15 miles of routes will require some type of improvement or maintenance work prior to being open for public use (Table SR-2). Work will include rocking of a crossing, soil compaction, construction

of rolling dips, and stabilization of tread. All work will be completed within the currently disturbed soil prism, except for route #46083502. This route contains some steep segments with erosional features. To accommodate safety concerns, switchbacks will be constructed on 2 short segments, and drainage will be established on the abandoned portions to address ongoing erosion and reduce the potential for future erosion from these areas.

Improvement and maintenance work is expected to be conducted within a 3-week period in the spring when soils are moist, so that compaction is effective. Effects from this work include disturbance and movement of soils on the road surface. In the long term, constructed drainage features will slow and divert of water from running surfaces into natural channels, reducing sediment generated from the routes.

The proposed Humbug open riding area (about 5 acres) is located in granitic soils. The site consists of a large flat with numerous OHV trails on the slopes above. The Juniper Flat open riding area is located on dry, relatively non-cohesive soils, and is largely unvegetated. Wheel rutting is the prevalent disturbance. No improvement work is proposed for either of these areas.

Environmental Consequences

Alternative 1

Direct and indirect effects of the prohibition of cross-country motorized vehicle travel

This alternative does not prohibit cross-country travel on 1.2 million acres of National Forest System Lands. There are 497 miles of unauthorized roads and trails that would continue to be used by vehicles, at least 228 miles with High or Very High EHRs. There is no way to quantify how many additional motorized routes may be created in soils with High or Very High EHRs in the future by continued motorized use.

In both the short and long term, soils on 994 acres would remain compacted and unvegetated. In addition, there would be ongoing impacts to soil productivity from the creation of new routes. It is impossible to estimate the additional number of acres that would be subject to compaction and soil displacement on the 1.2 million acres where off-road travel is allowed.

Direct and indirect effects of adding new facilities to NFTS

Under this alternative there would be no additions to the NFTS.

Cumulative effects

Soil productivity will be foregone in the long term on all 497 miles (994 acres) of unauthorized routes that continue to be used, and on roads added to the NFTS through ongoing and foreseeable road-related actions.

Ongoing and foreseeable road-related activities will add 39 miles (78 acres) of ML1 and ML2 roads to the NFTS, and decommission 48 miles of road (96 acres). In the long term, soil productivity will be foregone on approximately 1,072 acres, and improved on 96 acres.

Alternative 2

Direct and indirect effects of the prohibition of cross-country motorized vehicle travel

The prohibition of cross-country travel would prohibit vehicle use on 1.2 million acres, including 405 miles (810 acres) of unauthorized routes. This action will eliminate the potential for creation of additional unauthorized routes, and the associated impacts to soils. Over time, affected soils would gradually recover through revegetation, and a gradual decompaction of remnant soil. Most unauthorized routes in areas with High and Very High EHRs would not be expected to recover within 30 years; in a few cases, where a route is on a steep slope and soil loss is significant, the process of recovery may take many decades to centuries. Soil productivity would be expected to eventually return on a total of 810 acres.

Direct and indirect effects of adding new facilities to NFTS

This alternative proposes to add 92 miles of roads and motorized trails to the NFTS. Thirty-six miles of these routes, all within the Humbug drainage, have High or Very High EHRs. Fifteen miles of routes with drainage concerns will be brought up to standard using mechanized equipment within the current disturbed footprint. Two stream crossings will be rocked. Erosion control features, such as rolling dips, will be installed to manage runoff, minimize offsite movement of soil, and prevent degradation of the running surface. These types of measures have been used for drainage control on roads and skid trails on the KNF for many years, and have been shown to be effective in controlling water and reducing sediment (USDA Forest Service 2000-2008). Site-specific road and trail maintenance mitigations are displayed in Table SR-2. In both the short and long term, routes added to the NFTS will remain compacted and unvegetated, affecting 184 acres.

Sixty-five acres of open riding area (60 acres at Juniper Flat and 5 acres at Humbug Creek area) would be available for off-road motorized use. Currently both areas are in a highly degraded state, largely unvegetated. In both the short and long term, this condition would persist. A high degree of compaction prevails at Humbug Creek area, and some rutting on slopes. In both areas, soil productivity will be foregone in both the short and long terms.

Cumulative effects

Soil productivity will be adversely affected on all routes and facilities that are added to the NFTS through this project or through ongoing and foreseeable road-related actions. Soil condition

should improve with eventual natural loosening of the compacted soil and revegetation of unauthorized routes that are no longer used, and on decommissioned roads.

Ongoing and reasonably foreseeable road-related activities will add 39 miles (78 acres) of ML1 and ML2 roads to the NFTS, and decommission 48 miles of road (96 acres). Alternative 2 adds 92 miles of roads and trails (184 acres) and 65 acres of open riding areas to the NFTS. A total of 405 miles of unauthorized roads (810 acres) should recover in the long term. Soil productivity will be foregone on approximately 327 acres of roads, trails and open riding areas, and productivity should improve or be restored on 906 acres.

Alternative 3

Direct and indirect effects of the prohibition of cross-country motorized vehicle travel

The prohibition of cross-country travel would prohibit vehicle use on 1.2 million acres, including 497 miles of unauthorized routes. In the short term, there will be no change from the current condition. In the long term, these routes will slowly recover and revegetate; 994 acres of soils will return to a productive state. This action will eliminate the potential for creation of additional unauthorized routes, and the associated impacts to soils.

Direct and indirect effects of adding new facilities to NFTS

Under this alternative there would be no additions to the NFTS.

Cumulative effects

With the prohibition on cross-country travel, soils on all 497 unauthorized routes (994 acres) will naturally loosen, reducing compaction, and revegetate over time. Ongoing and foreseeable road-related activities will add 39 miles (78 acres) of roads (ML1 and ML2) to the NFTS, and decommission 48 miles (96 acres) of road. Decommissioning activities will encourage soil decompaction and revegetation; 100 acres will recover soil productivity in the long term. Soil productivity will be foregone on 78 acres of new roads, and productivity should improve or be restored on 1,090 acres.

Alternative 4

Direct and indirect effects of the prohibition of cross-country motorized vehicle travel

The prohibition of cross-country travel would prohibit vehicle use on 1.2 million acres, including 490 miles (980 acres) of unauthorized routes. In the short term, there will be no change from the current condition. In the long term, these routes will slowly recover and revegetate; 980 acres of soils will return to a productive state. This action will eliminate the potential for creation of additional unauthorized routes, and the associated impacts to soils.

Direct and indirect effects of adding new routes to NFTS

This alternative proposes to add 7 miles of roads and motorized trails to the NFTS, none with High or Very High EHRs. In both the short and long term, routes added to the NFTS will remain compacted and unvegetated, affecting 14 acres. Site-specific road and trail mitigations are displayed in Table SR-2.

Cumulative effects

Ongoing and foreseeable road-related activities will add 39 miles (78 acres) of ML1 and ML2 roads to the NFTS, and decommission 48 miles of road (96 acres). Alternative 4 adds 7 miles of roads and trails (14 acres) to the NFTS. A total of 490 miles of unauthorized roads (980 acres) should recover in the long term. Soil productivity will be foregone on approximately 92 acres of roads and trails, and productivity should improve or be restored on 1,076 acres.

Alternative 5

Direct and indirect effects of the prohibition of cross-country motorized vehicle travel

The prohibition of cross-country travel would prohibit vehicle use on 1.2 million acres, including 428 miles (856 acres) of unauthorized routes. In the short term, there will be no change from the current condition. In the long term, these routes will slowly recover and revegetate; 856 acres of soils will return to a productive state. This action will eliminate the potential for creation of additional unauthorized routes, and the associated impacts to soils.

Direct and indirect effects of adding new facilities to NFTS

This alternative proposes to add 69 miles of roads and motorized trails to the NFTS, 36 miles in high or very high EHRs. In both the short and long term, these routes will remain compacted and unvegetated. Routes with drainage concerns will be brought up to standard using mechanized equipment within the current disturbed footprint. Erosion control features, such as rolling dips, will be installed to manage runoff, minimize offsite movement of soil, and prevent degradation of the running surface. These types of measures have been used for drainage control on roads and skid trails on the KNF for many years, and have been shown to be effective in controlling water and reducing sediment (USDA Forest Service 2000-2008). Road and trail maintenance standards are included in the project file. In both the short and long term, routes added to the NFTS will remain compacted and unvegetated, affecting soil productivity on 138 acres. Site-specific road and trail mitigations are displayed in Table SR-2.

Fifty-three acres of open riding area (48 acres at Juniper Flat and 5 acres at Humbug Creek area) would be available for off-road motorized use. Currently both areas are in a highly degraded state, largely unvegetated. In both the short and long term, this condition would persist. A high

degree of compaction prevails at Humbug Creek area, and some rutting on slopes. In both areas, soil productivity will be foregone in both the short and long terms.

Cumulative effects

Ongoing and foreseeable road-related activities will add 39 miles (78 acres) of ML1 and ML2 roads to the NFTS, and decommission 48 miles of road (96 acres). Alternative 5 adds 69 miles of roads and trails (138 acres) and 53 acres of open riding areas to the NFTS. A total of 428 miles of unauthorized roads (856 acres) should recover in the long term. Soil productivity will be foregone on approximately 269 acres of roads, trails and open riding areas, and productivity should improve or be restored on 952 acres.

Alternative 6

Direct and indirect effects of the prohibition of cross-country motorized vehicle travel

The prohibition of cross-country travel would prohibit vehicle use on 1.2 million acres, including 438 miles (876 acres) of unauthorized routes. In the short term, there will be no change from the current condition. In the long term, these routes will slowly recover and revegetate; 876 acres of soils will return to a productive state. This action will eliminate the potential for creation of additional unauthorized routes, and the associated impacts to soils.

Direct and indirect effects of adding new facilities to NFTS

This alternative proposes to add 59 miles of roads and motorized trails to the NFTS, 36 miles in high or very high EHRs. In both the short and long term, these routes will remain compacted and unvegetated. Routes with drainage concerns will be brought up to standard using mechanized equipment within the current disturbed footprint. Erosion control features, such as cross ditches or rolling dips, will be installed to manage runoff, minimize offsite movement of soil, and prevent degradation of the running surface. These types of measures have been used for drainage control on roads and skid trails on the KNF for many years, and have been shown to be effective in controlling water and reducing sediment (USDA Forest Service 2000-2008). Site-specific road and trail mitigations are displayed in Table SR-2.

Fifty-three acres of open riding area (48 acres at Juniper Flat and 5 acres at Humbug Creek area) would be available for off-road motorized use. Currently both areas are in a highly degraded state, largely unvegetated. In both the short and long term, this condition would persist. A high degree of compaction prevails at Humbug Creek area, and some rutting on slopes. In both areas, soil productivity will be foregone in both the short and long terms.

Cumulative effects

Ongoing and foreseeable road-related activities will add 39 miles (78 acres) of ML1 and ML2 roads to the NFTS, and decommission 48 miles of road (96 acres). Alternative 6 adds 59 miles of roads and trails (118 acres) and 53 acres of open riding areas to the NFTS. A total of 438 miles of unauthorized roads (876 acres) should recover in the long term. Soil productivity will be foregone on approximately 249 acres of roads, trails and open riding areas, and productivity should improve or be restored on 972 acres.

Alternative 7

Direct and indirect effects of the prohibition of cross-country motorized vehicle travel

The prohibition of cross-country travel would prohibit vehicle use on 1.2 million acres, including 423 miles (846 acres) of unauthorized routes. In the short term, there will be no change from the current condition. In the long term, these routes will slowly recover and revegetate; 846 acres of soils will return to a productive state. This action will eliminate the potential for creation of additional unauthorized routes, and the associated impacts to soils.

Direct and indirect effects of adding new facilities to NFTS

This alternative proposes to add 74 miles of roads and motorized trails to the NFTS, 30 miles in high or very high EHRs. In both the short and long term, these routes will remain compacted and unvegetated. Routes with drainage concerns will be brought up to standard using mechanized equipment within the current disturbed footprint. Erosion control features, such as cross ditches or rolling dips, will be installed to manage runoff, minimize offsite movement of soil, and prevent degradation of the running surface. These types of measures have been used for drainage control on roads and skid trails on the KNF for many years, and have been shown to be effective in controlling water and reducing sediment (USDA Forest Service 2000-2008). Site-specific road and trail mitigations are displayed in Table SR-2.

Fifty-three acres of open riding area (48 acres at Juniper Flat and 5 acres at Humbug Creek area) would be available for off-road motorized use. Currently both areas are in a highly degraded state, largely unvegetated. In both the short and long term, this condition would persist. A high degree of compaction prevails at Humbug Creek area, and some rutting on slopes. In both areas, soil productivity will be foregone in both the short and long terms.

Cumulative effects

Ongoing and foreseeable road-related activities will add 39 miles (78 acres) of ML1 and ML2 roads to the NFTS, and decommission 48 miles of road (96 acres). Alternative 7 adds 74 miles of roads and trails (148 acres) and 53 acres of open riding areas to the NFTS. A total of 423 miles of unauthorized roads (846 acres) should recover in the long term. Soil productivity will be

foregone on approximately 279 acres of roads, trails and open riding areas, and productivity should improve or be restored on 932 acres.

Site-Specific Mitigations for Soils

Table SR-2. Mitigation for unauthorized routes proposed for addition to NFTS.

Route ID	Improvement Work Required	Alternative	Mileage
7H002.2	Rock crossing and approaches; Middle Humbug Creek	2,5,6,7	
51-02	Rock crossing and approaches; Long John Creek	2,5,6	
7H002.4	Rock crossing and approaches;Middle Humbug Creek	4,5,6	
45N53.3	Outslope/improve drainage	2,5,6,7	0.11
7H002.3	Outslope/improve drainage	2	0.43
45N88.2	Improve drainage/establish tread	5,6,7	3.00
46N24.5	Improve drainage/establish tread	5,6,7	0.77
46N30.9	Improve drainage/establish tread	2,5,6,7	0.18
7H002.4	Improve drainage/establish tread	4,5,6	0.29
7J001.11	Improve drainage/establish tread	2,5,6,7	0.29
7J001.9	Improve drainage/establish tread	2,5,6,7	0.84
7J031.5	Improve drainage/establish tread	5,6,7	0.05
8J002.3*	Improve drainage/establish tread	5	0.75
8J002.3*	Improve drainage/establish tread	6,7	0.25
8J002.3A	Improve drainage/establish tread	5	0.14
8J002.3C	Improve drainage/establish tread	5,6,7	0.14
45080101	Improve drainage/establish tread	5,6,7	0.45
45080104	Improve drainage/establish tread	5,6,7	0.23
45080201	Improve drainage/establish tread	5,6	0.14
45080202	Improve drainage/establish tread	5,6	0.10
45080205	Improve drainage/establish tread	2,5,6,7	0.74
45080207	Improve drainage/establish tread	2,5,6,7	0.65
45080209	Improve drainage/establish tread	2	0.18
45080301	Improve drainage/establish tread	2,5,6,7	0.43
45081003	Improve drainage/establish tread	2	0.24
45081203	Improve drainage/establish tread	2	0.27
46083401	Improve drainage/establish tread	2,5,6,7	2.43
46083501*	Improve drainage/establish tread	2	0.78
46083501*	Improve drainage/establish tread	5,6,7	0.57
46083502	Improve drainage/establish tread/develop switchbacks on steep portions	2,5,6,7	0.94
46083503	Improve drainage/establish tread	2,5,6,7	0.38

***Route has different mileage depending on alternative**

Summary of Effects Across All Alternatives

Improvements to soil resources should occur under every action alternative due to the beneficial effects of the prohibition on cross-country travel. Alternative 3 would have the greatest benefits because it does not propose addition of routes to the NFTS; there would be no impacts to long-term soil productivity from this alternative. Alternative 1 would have the greatest impacts to soils, because soil displacement and compaction could occur on any of the 1.2 million acres where off-highway travel is allowed.

Table SR-3. Comparison of soil resource indicators

Indicators		Alt 1	Alt 2	Alt 3	Alt 4	Alt 5	Alt 6	Alt 7
Miles of unauthorized routes/routes proposed for addition to NFTS		497	92	0	7	69	59	74
Acres (of routes) that will recover soil productivity in the long term		0	810	994	980	856	876	846
Miles of unauthorized routes (Alt 1) or routes proposed for addition to the NFTS in Erosion Hazard Ratings*	Low	20	3	0	0	4	3	16
	Moderate	212	49	0	6	30	28	27
	High	160	18	0	1	17	16	17
	Very High	68	18	0	0	18	9	13

***Numbers are rounded off – miles without soil map coverage are not included.**

Compliance with the LRMP and Other Direction

Alternative 1 allows creation of additional unauthorized routes where soil productivity could be compromised in the long term. This is inconsistent with LRMP direction to maintain or enhance soil resources.

Under any action alternative, substantial gains in soil productivity will be realized in the long term due to the prohibition of cross-country motorized travel, which is consistent with LRMP direction. By definition NFTS roads and trails and other areas not dedicated to growing vegetation are not considered activity areas to which Soil Quality Standards are applied. Therefore, any route or area already within the NFTS or brought into the NFTS by any alternative considered in this plan is not subject to the regional or national standards of soil productivity. However, all action alternatives address the need to protect and improve soil resources, and (with the exception of Alternative 3) include mitigation measures to minimize off-site soil movement.

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Hydrology

Introduction

Protection of water quantity and quality is an important part of the mission of the Forest Service (Forest Service Strategic Plan for 2007 to 2012, July 2007). Management activities on National Forest System (NFS) lands must be planned and implemented to protect the hydrologic functions of forest watersheds, including the volume, timing, and quality of stream flow. The use of roads, trails, and other areas on national forests for public operation of motor vehicles has the potential to affect these hydrologic functions through compaction of soils and detachment of sediment (e.g., Foltz, 2006). Management decisions to eliminate cross-county motor vehicle travel, add routes and areas to the National Forest Transportation System (NFTS), and make changes to the existing NFTS must consider effects on watershed functions.

Analysis Framework: Statute, Regulation, LRMP, and Other Direction

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

Clean Water Act of 1948 (as amended in 1972 and 1987) establishes as federal policy the control of point and non-point pollution and assigns the States the primary responsibility for control of water pollution. Compliance with the Clean Water Act by national forests in California is achieved under state law.

Water quality objectives are outlined in the California North Coast Regional Water Quality Control Board's **Water Quality Control Plan for the North Coast Region, as adopted by the NCRWQCB on December 9, 1993, Including Amendments Through 2004** (North Coast Region Water Quality Control Board 2001) (Basin Plan). The primary purpose for maintaining water quality is to assure that the beneficial uses of water are not adversely affected. The Basin Plan for the Klamath River contains water quality objectives, implementation plans for meeting those objectives, and other policies of the State Water Quality Control Board and the Federal Government.

Non-point source pollution on national forests is managed through the **Regional Water Quality Management Plan (USDA Forest Service, Pacific Southwest Region, 2000)**, which relies on implementation of prescribed Best Management Practices (BMPs). The Water Quality Management Plan includes one BMP for OHV use (4-7) and 28 BMPs related to road construction and maintenance (2-1 to 2-28) (project file:Klamath_Travel_BMPs.doc). All NFS roads and trails open to OHV use are required to comply with these BMPs.

Of particular relevance for motor vehicle travel management, BMP 4-7 requires each National Forest to: (1) identify areas or routes where OHV use could cause degradation of water

quality, (2) identify appropriate mitigation and controls, and (3) restrict OHV use to designated routes. This BMP further requires Forests to take immediate corrective actions if considerable adverse effects are occurring or are likely to occur.

The California Water Code consists of a comprehensive body of law that incorporates all state laws related to water, including water rights, water developments, and water quality. The laws related to water quality (sections 13000 to 13485) apply to waters on the national forests and are directed at protecting the beneficial uses of water. Of particular relevance for the proposed action is section 13369, which deals with non-point source pollution and best management practices.

The North Coast Regional Water Quality Control Board (Water Board) has developed **Total Maximum Daily Loads (TMDLs)** for the Scott, Shasta, and Salmon Rivers, and a draft TMDL for the Klamath River. Together, these four TMDLs cover every stream on the Klamath National Forest. The TMDLs are amendments to the Basin Plan and are part of the California Water Code. The Water Board has determined that compliance with the TMDLs should attain and maintain the water quality objectives for sediment and temperature, and restore and protect beneficial uses. Each TMDL has an Action Plan that describes specific implementation actions that the Forest Service shall take to achieve the TMDLs and attain water quality standards. One of the required implementation actions is control of road-related sediment sources.

The Porter-Cologne Water-Quality Act, as amended in 2006, is included in the California Water Code. This act provides for the protection of water quality by the State Water Resources Control Board and the Regional Water Quality Control Boards, which are authorized by the U.S. Environmental Protection Agency to enforce the Clean Water Act in California.

Klamath National Forest Land and Resource Management Plan (LRMP; USDA Forest Service 1995) outlines the Forest-wide standards and guidelines for water resources. These are augmented by standards and guidelines for each management area. The LRMP incorporated the Aquatic Conservation Strategy (ACS) objectives and standards and guidelines from the Northwest Forest Plan. The ACS was developed to restore and maintain the ecological health of watersheds on public lands, and the aquatic ecosystems contained within them. Two important parts of the ACS are Riparian Reserves (RRs) and Key Watersheds. Standards applicable to this project are listed here.

6-32 In fish-bearing streams, design new road crossings to maintain a natural stream bottom. Existing low water crossings should be evaluated for impacts on aquatic resources and reconfigured as appropriate.

MA10-3 As a general rule, standards and guidelines for RRs prohibit or regulate activities in RRs that retard or prevent attainment of the Aquatic Conservation Strategy objectives.

Effects Analysis Methodology

The hydrologic analysis was conducted in two phases. First, the GIS layer of unauthorized routes was queried to identify routes to be analyzed for possible addition to the NFTS. Screening criteria sources were the Klamath National Forest LRMP, the Clean Water Act, Best Management Practices, the Endangered Species Act, and the North Coast Regional Water Quality Board Basin Plan, as well as professional judgment on whether or not resource concerns could be mitigated if routes were added to the NFTS. Routes that presented serious resource concerns that could not be mitigated, or that did not meet the purpose and need for the project, were eliminated from consideration in the project.

The second phase of the analysis focused on field reviews of all unauthorized routes that passed the first screening and were included in one or more of the action alternatives. Field review identified soil erosion features and the relative risk of sediment delivery to stream channels. More miles of unauthorized routes were removed from analysis after field investigation, primarily because of proximity to streams.

The existing condition, which includes the effects of past actions, was assessed using the Forest Service equivalent roaded area (ERA) model (USFS 1988). ERA is an index of ground-disturbing activities that weights different management activities relative to the effects of a road in terms of altering runoff. The ERA values are then compared against a Threshold of Concern (TOC), beyond which there is risk of adverse effects to instream beneficial uses. The ERA model was used to assess the current condition within watersheds.

Assumptions Specific to the Hydrology Analysis

- The principal effect of cross-country motor vehicle travel is increased erosion, resulting in fine sediment that is transported by runoff from running surfaces (Bilby et al, 1989, Forsyth et al, 2006, Sheridan et al, 2006).
- Motorized vehicle use is the predominant cause of sediment production from use of native-surface routes.
- All vehicle types generate the same level of effects on road surfaces.
- Roads located in riparian reserves (as defined in the LRMP) have the greatest risk of delivering sediment to stream channels, or impacting stream temperature through removal of riparian vegetation.

- The effects of roads on soil erosion and stream shade will generally persist for about 30 years following prohibition of public motor vehicle use.
- In 7th field watersheds with one mile or less of unauthorized routes, effects of route designation will not be discernable.
- Spatial boundary for the direct and indirect effects analysis is the affected 7th field watersheds within the forest boundary.
- Spatial boundary for the cumulative effects analysis is the forest boundary.

Data Sources

- Field inventories of unauthorized routes and associated tabular data sets.
- GIS analyses of route miles within riparian reserves.
- Klamath National Forest Forest-wide Roads Analysis.
- Air and ground photos and anecdotal information documenting the time required for passive restoration of routes closed to motor vehicle traffic (recovery time may vary based on precipitation, elevation, aspect, and other factors).

Indicators

- Miles of unauthorized routes/routes proposed for addition to the NFTS in riparian reserves and key watersheds.
- Miles of unauthorized routes/routes proposed for addition to the NFTS with documented surface erosion in riparian reserves.
- Road density within 7th field watersheds that have routes proposed for addition to the NFTS. (Road density includes all open state, county, private, and NFTS roads plus publicly identified unauthorized routes including short spurs to dispersed recreation areas.)

Water Resources Methodology by Action

1. Direct and indirect effects of the prohibition of cross-country motor vehicle travel.

Short-term timeframe: 1 year.

Long-term timeframe: > 30 years, based on observation of recovery of routes in the Forest by resource staff (Laurent, 2009, personal communication).

Spatial boundary: Forest

Indicator: Miles of unauthorized routes in riparian reserves and key watersheds.

Methodology: GIS analysis of existing unauthorized routes/routes located within riparian reserves and key watersheds. Field reviews for soil erosion and proximity to streams were conducted on all miles of unauthorized routes being considered for inclusion in the NFTS.

2. Direct and indirect effects of adding facilities to the NFTS

Short-term timeframe: 1 year.

Long-term timeframe: > 30 years.

Spatial boundary: Forest (7th field watersheds where additions to the NFTS or open riding areas are proposed)

Indicators: (1) miles of routes proposed for addition to the NFTS in riparian reserves and key watersheds; (2) miles of routes proposed for addition to the NFTS with documented surface erosion.

Methodology: Query of GIS database of unauthorized routes proposed for addition to the NFTS in the watersheds affected by additions to NFTS.

3. Direct and indirect effects of changes to the NFTS.

No measurable changes in volume of traffic are anticipated. Changes in the type of vehicles using roads and distribution of vehicle use may change over the KNF, but this should not affect hydrologic resources or create effects on water quality. This action will not be addressed further in this section.

4. Cumulative effects

Cumulative effects are the combined direct and indirect effects of this project and those from ongoing or foreseeable management projects. Management activities that can affect hydrologic conditions include vegetation management projects and road management activities (such as construction or decommissioning). These projects have separate environmental analyses that include mitigation measures to ensure impacts to hydrologic resources are minimized. However, of all management activities, road-related projects have the greatest potential to affect hydrologic resources, as they can lead to long term changes in runoff or road densities. Therefore, this cumulative effects analysis focuses on ongoing and foreseeable road-related projects (listed in Appendix B).

Long-term timeframe: > 30 years.

Spatial boundary: Klamath National Forest boundary

Indicator: Open route density by 7th field watershed. Route density represents the cumulative effects of the NFTS and unauthorized routes (Alternative 1), or the NFTS and routes added to the NFTS (action alternatives.

Methodology: GIS database query.

Affected Environment

There are four hundred and nine 7th field watersheds on the KNF. Cross-country travel currently is allowed in parts or all of 364 of these watersheds. Unauthorized routes exist in one hundred and eighty-eight 7th field watersheds. On the east side of the KNF (Goosenest Ranger District) there are seventy-nine 7th field watersheds, 74 of which include unauthorized routes. On the west side of the KNF, 114 of the three hundred and thirty 7th field watersheds include unauthorized routes. The effects of this project would be most discernable in watersheds that include at least 1 mile of unauthorized route proposed for addition to the NFTS. Effects on watersheds that have less than 1 mile of unauthorized route proposed for addition to the NFTS in any action alternative are included in the project record, available at the KNF Supervisor's Office in Yreka, CA.

Nine watersheds on the west side of the KNF include more than 1 mile of proposed additions to the NFTS in one or more action alternative; 2 additional watersheds are analyzed because they are important for fisheries. All are tributaries to the Klamath, Scott, and Salmon Rivers. The west side watersheds are all considered coldwater sources for anadromous fish.

Seventeen analyzed watersheds located on the east side of the Forest are considered to be tributaries to the Klamath River even though they drain interiory and do not connect directly to the river. The east side watersheds are characterized by relatively flat terrain and porous volcanic soils; most of these watersheds do not have surface water or riparian reserves. Where surface water is present, beneficial uses for cold water habitat are limited to resident fisheries (see further discussion in the Fisheries section of this chapter).

All of the watersheds affected by this project are listed as water quality impaired under section 303(d) for temperature and are considered tributaries of the Klamath River. The Water Board has concluded that road-related sediment is a contributing factor for increased steam temperatures because it contributes to wider and shallower steam channels. Watersheds in the Scott River are listed as impaired for sediment, with roads in general being targeted as sediment source. None of these watersheds include more than 1 mile of unauthorized route proposed for addition to the NFTS in any action alternative.

There are one hundred and thirty-three 7th field key watersheds on the KNF; unauthorized routes exist in 33 of them. Kanaka-Olsen and East Fork South Fork Salmon Headwaters are the only 7th field key watersheds for which the mileage proposed for addition to the NFTS in any

action alternative exceeds 1 mile. For both watersheds, the proposed additions of 1 to 1.3 miles of routes are short spurs to a number of dispersed recreation sites.

The current condition of each watershed analyzed for this project was assessed using the equivalent roaded area (ERA) analysis. All watersheds are under the threshold of concern and appear to have a low risk of adverse watershed impacts being expressed on the landscape (Tables H-1 and H-2).

Current road densities (including unauthorized routes and NFTS, state, county and private roads) exceed 4 miles/mi^2 for the Buckhorn, Cougar-Malone, Middle Fork Humbug and Upper Humbug 7th field watersheds on the west side of the KNF, and Haight Mountain, Lower First Creek, Tennant-Antelope, Upper First Creek and Van Bremmer Well on the east side (Table H-3). Due to porous soils, generally gentle slopes, and the absence of surface water, road density has minimal, if any, effects on hydrologic resources on the east side.

Most of the unauthorized routes considered in this analysis are not engineered; that is, they have not been designed but have been created through repeated vehicle travel on relatively gentle slopes. Most have been hardened through use, and surfaces are generally stable and self-maintaining. Much of the mileage proposed for addition to the NFTS consists of relatively short, rough-surfaced routes that access dispersed recreation sites. About 67 miles of these routes lie within riparian reserves, although few actually affect riparian vegetation (see Wildlife and Fisheries sections of this chapter for a more complete discussion of impacts to riparian resources).

Documented soil erosion occurs on about 15 miles of unauthorized routes, all in the Humbug drainage; approximately 2.5 miles are in riparian reserves. Conditions in the Humbug drainage differ from other areas of the Forest. The Humbug drainage includes three 7th field watersheds (Upper Humbug, Middle Fork Humbug, and Lower Humbug Creek). The drainage has erodible granitic soils and is close to the town of Yreka, so public use is relatively high. Humbug has a long history of mining, logging, and human manipulation. At one time, a community of 6,000 people lived in the bottom of the canyon. Extensive modification of hillside hydrology occurred with creation of terraces for reforestation after the 1955 Haystack Fire. Humbug supports a large system of constructed routes built for mining or logging using heavy equipment; none have culverts, but some have berms, ditches or cutbanks. Some segments route surface flow into dry channels. While there is some evidence of sediment movement in these channels, most do not show evidence of annual scour so sediment delivery to Humbug Creek proper does not appear to be an annual event. Extensive field review of the unauthorized routes in Humbug was conducted to validate current route conditions, stability, and suitability for inclusion in the NFTS. An area of approximately 5 acres of concentrated off-road use is located in the Humbug drainage.

Table H- 5. West side watersheds with proposed additions to NFTS showing current CWE calculations

7th Field Watershed	Acres	Current % ERA	TOC in %ERA
Big Ferry-Swanson	7,637	5.8	9.0
Buckhorn Creek	9,153	6.2	7.0
Clear	2,775	3.6	10.5
Cole-Clauson	9,268	2.1	7.5
EF SF Salmon Headwaters	6,779	1.2	9.0
Kanaka/Olsen	8,288	2.7	10.0
Little Humbug Cr.[11]	6,044	1.8	9.5
Louie-Schutts	6,695	3.5	9.0
Lower Humbug Cr.[12]	12,962	1.7	10.5
Middle Fork Humbug	4,998	2.1	10.0
Upper Humbug	7,994	2.5	9.5

Table H-6. East side watersheds with proposed additions to NFTS, showing current CWE calculations

7th Field Watershed	Acres	Current % ERA	TOC in %ERA
Antelope Sink	9,798	5.0	11.0
Bray/Butte	9,088	1.	11.0
Garner Mtn.	11,961	4.5	13.0
Haight Mtn.	8,457	4.9	11.0
Hill 22	3,709	4.0	16.5
Lower First C.	3,597	5.2	11.0
Meiss Lake	72,184	1.0	12.5
Mud Lake	7,858	2.8	13.0
Pollic Flat	11,847	3.7	12.5
Shafter/Butte C.	11,394	1.7	12.0
Sharp Mtn.	4,535	1.0	13.0
Tamarack Flat	10,600	2.2	16.5
Tennant-Antelope	8,175	5.4	11.5
Up. First C.	7,039	5.3	12.0
Up. Shovel C.	6,856	2.1	10.5
Van Bremmer Well	5,390	4.2	13.5
W. Red Rock Valley	3,930	0.8	13.0

[11] Watershed included because of importance to fisheries.
[12] Watershed included because of importance to fisheries.

Environmental Consequences

The primary hydrologic effect of forest routes is to alter hill slope drainage by intercepting precipitation either directly, as it falls on impervious surfaces, or indirectly, as groundwater flow emerging at the road cut face. Depending on the engineered drainage of a route, intercepted water may be transported to streams much faster than would occur naturally, augmenting peak flows and altering their timing (Jones and Grant, 1996; Wemple and Jones, 2003).

Water flowing off surfaces of routes will readily detach and transport sediment less than 0.5mm in diameter. This class of sediment can be particularly injurious in fish-bearing steams (see Fisheries section). Where drainage runs directly as surface flow, either at crossings or rutted relief drains, research has shown that roads can add large amounts of fine sediment to a natural system (Bilby, 1989). Fines created by traffic duing the dry season are washed away with the first storm events of each wet season (Luce and Black, 1999). Sediment production from routes used by OHVs is variable, both seasonally and from year to year; determining the amount of sediment generated by any specific segment, and whether than sediment is delivered to a stream, is uncertain.

Routes can indirectly increase stream temperatures as a result of stream crossing or fill slope failures. Debris flows triggered by clogged culverts or stream diversions can scour stream channels, remove riparian vegetation, and reduce stream shade. However, this process is unlikely to occur as a result of this project because the majority of the routes analyzed were created by repeated vehicle traffic and do not have ditches, cut slopes or fills. With a few exceptions, they are on relatively gentle slopes with very little risk of landslides (see Geology section).

Alternative 1

Direct and indirect effects of prohibition of cross-country motor vehicle travel

This alternative does not prohibit cross-country travel. About 1.2 million acres of the KNF would remain open to unrestricted OHV use including 497 miles of existing unauthorized routes in 188 7th field watersheds (67 miles within riparian reserves). The current level of traffic-generated sediment would be expected to continue, and new routes that represent threats to water quality could be created. Vegetation would not recover on the new or existing routes, and effects would persist through the short and long term.

Unauthorized routes that cross at least 14 streams would continue to be used and could have some effect on stream temperatures. Documented soil erosion would continue on about 15 miles of unauthorized routes in the Humbug drainage.

Direct and indirect effects of adding facilities to the NFTS

There would be no routes added to the NFTS; therefore, there would be no direct or indirect effects.

Cumulative Effects

Cumulative effects include the additive effects of this project and those of ongoing and reasonably foreseeable actions (listed in Appendix B). Road-related projects would add 13 miles of ML 1 road, 26 miles of ML 2 roads, remove 50 miles from the NFTS (48 miles through decommissioning and 2 miles through conversion to a hiking trail). All but 1 mile of new open road (ML 2) are on the Goosenest Ranger District where routes have minimal effects on water resources. Hydrologic conditions would be slightly improved by ongoing or reasonably foreseeable road-related projects. Cumulative watershed effects displayed in Tables H-1 and H-2 represent the current condition. There would be a reduction in road density in several watersheds due to road removal from ongoing and reasonably foreseeable actions; of the watersheds analyzed in this project, approximately 1.5 miles of NFTS road would be decommissioned in the Buckhorn watershed (Table H-5). Cumulative reductions in road density would be entirely due to the effects of these ongoing or reasonably foreseeable actions since there would be no reduction due to the actions in this alternative; road density would stay the same as current except for a decrease of less than 10% in Buckhorn. Proliferation of unauthorized routes in this alternative could increase road density in all watersheds other than in wilderness in the future.

Alternative 2

Direct and indirect effects of the prohibition of cross-country motor vehicle travel

This prohibition would remove vehicle use from 1.2 million acres, including 405 miles of unauthorized routes. In the short term, substantial benefits would be expected in reduction of fine sediment (mostly < 0.5 mm in diameter) that is transported off running surfaces of 44 miles of routes in riparian reserves (Reid and Dunne, 1984).

Routes where motorized use is prohibited may still intercept and concentrate surface flows for some time. In the long term, soils in many undesignated routes would decompact and the routes would revegetate, increasing infiltration capacity of running surfaces and reducing road-directed runoff. Routes in areas of High and Very High Soil Erosion Hazard (primarily in the Humbug drainage) would not recover in the long term (see the Soils section of this chapter). Determining benefits from the prohibition of vehicle use on unauthorized routes would be difficult to assess because the response to runoff and sediment yield is variable and uncertain (Foltz, 2006). Cessation of use should create almost immediate reductions in fine sediment yield.

Direct and indirect effects of adding facilities to the NFTS

This alternative would add 92 miles of roads and motorized trails to the NFTS, 23 miles within riparian reserves and 7 miles in key watersheds, all of the latter in short spurs to dispersed recreation sites. Evidence of surface erosion was found on about 9 miles of routes proposed for addition to the NFTS, 1.6 miles of which were in riparian reserves and none in key watersheds.

Routes added to the NFTS would not recover in the short or long term. These routes would continue to intercept and concentrate precipitation and groundwater flow into surface runoff. However, 9 miles of routes in Humbug would receive improvement and maintenance (surface compaction, creation of drainage features, etc.) which should reduce the potential for traffic-related sediment. Vehicle traffic would continue displace soils and contribute to some level of erosion and sediment delivery to streams. Two routes with perennial stream crossings would be added to the NFTS. Mitigations to reduce or eliminate erosion, including treatment of stream crossings, are displayed in the Soils and Recreation sections of this chapter.

Route densities would decrease more than 10% in 14 of the 17 watersheds on the east side of the KNF and in 5 of 11 watersheds on the west side. The most dramatic decreases on the west side are in the Upper Humbug, Middle Humbug, Little Humbug, Lower Humbug, and Clear Creek watersheds, in that order. In the rest of the west side watersheds, there are few unauthorized routes and most of them are short spurs to dispersed recreation sites.

Sixty-five acres of open riding area (60 acres in Juniper Flat and 5 acres in Humbug) would be available for use. Neither area poses a risk to water quality because they lack connection to perennial streams. There are no hydrologic issues associated with Juniper Flat. In Humbug, it is likely that present conditions would persist in both the short and long term, as many of the existing routes are in erodible soils and recovery may take many years.

Cumulative Effects

Cumulative effects for this alternative are the additive effects of prohibiting cross-country motorized travel on 1.2 million acres, adding 92 miles of unauthorized route to the NFTS, and ongoing and reasonably foreseeable road-related actions. Ongoing and foreseeable actions will add 13 miles of ML 1 road, 26 miles of ML 2 road, and remove 50 miles of road from the NFTS (48 through decommissioning and 2 through conversion to a hiking trail). All but 1 mile of new open road (ML 2) are on the Goosenest Ranger District where hydrologic resources are of minimal concern. All the road removal will occur on the west side of the KNF. Cumulative effects for this alternative would result in a reduction in open route density by 10% or more in 19 of the 28 analyzed watersheds. Ongoing and reasonably foreseeable road-related actions would not reduce open road mileage by more than 10% in the one analyzed watershed on the west side that includes road removal. Increases in road density would occur in 8 east side watersheds due to ongoing and reasonably foreseeable actions but the cumulative decrease in road density from the alternative and foreseeable actions would still be more than 10% in 6 of the 8 watersheds. There

should be a decrease in fine sediment delivered to streams in all these watersheds. Positive hydrologic trends would be expected. Cumulative effects are summarized in Table H-5. Overall, effects are considered to be beneficial to water resources.

Alternative 3

Direct and indirect effects of the prohibition of cross-country motor vehicle travel

The direct and indirect effects of prohibiting cross-country motorized travel are the same as those described under Alternative 2, except they would apply to all 497 miles of unauthorized routes. Sixty-seven miles of routes within riparian reserves would be allowed to recover in the long term.

Direct and indirect effects of adding facilities to the NFTS

No current unauthorized routes would be added to the NFTS; therefore, there would be no direct or indirect effects.

Cumulative Effects

The prohibition of cross country motorized travel combined with addition of 13 miles of ML1 road, 26 miles of ML 2 road, and removal of 50 miles of NFTS road will result in a reduction in open route density of 10% or more in 19 analyzed 7th field watersheds. Ongoing and foreseeable road-related actions will reduce open road density by more than 10% in one analyzed watershed on the west side of the KNF. On the east side, road densities would decrease by 10% in 7 of the 8 analyzed watersheds that include road-related ongoing and reasonably foreseeable actions. Positive hydrologic trends (including a reduction in route-related sediment) would be expected in these watersheds. Cumulative effects are summarized in Table H-5. Effects are considered to be completely beneficial to water resources.

Alternative 4

Direct and indirect effects of the prohibition of cross-country motor vehicle travel

The direct and indirect effects of prohibiting cross-country motorized travel are the same as those described under Alternative 2, except they would apply to 490 miles of unauthorized routes.

Direct and indirect effects of adding facilities to the NFTS

This alternative adds about 7 miles of roads and motorized trails to the NFTS in analyzed 7th field watersheds. Only about 0.4 mile is within a riparian reserve and none are in key watersheds. Documented soil erosion was found on 0.3 mile of route proposed for addition to the NFTS. One route with a perennial stream crossing is proposed for addition to the NFTS. This stream crossing would be rocked according to the mitigations displayed in the Soils and Recreation sections of this chapter. No open riding areas are proposed in this alternative.

The added routes would not recover in the long term and would continue to intercept and concentrate precipitation and groundwater flow into surface runoff contributing to erosion and sediment delivery to streams.

Cumulative effects

Cumulative effects are similar to those discussed under Alternative 3. Overall, effects are considered to be beneficial to water resources.

Alternative 5

Direct and indirect effects of the prohibition of cross-country motorized vehicle travel

The direct and indirect effects of prohibiting cross-country motorized travel are the same as those described under Alternative 2, except they would apply to 428 miles of unauthorized routes (46 miles within riparian reserves).

Direct and indirect effects of adding facilities to the NFTS

This alternative would add 69 miles of roads and motorized trails to the NFTS in analyzed 7th field watersheds, 21 miles within riparian reserves and 7.6 in key watersheds, all of the latter in short spurts to dispersed recreation sites. Evidence of soil erosion was found on almost 14 miles of unauthorized routes proposed for addition to the NFTS, 2.3 of which were in riparian reserves and none in key watersheds.

Routes added to the NFTS would not recover in the short or long term. These routes would continue to intercept and concentrate precipitation and groundwater flow into surface runoff. However, almost 14 miles of routes in Humbug would receive improvement and maintenance (surface compaction, creation of drainage features, etc.) which should reduce the potential for traffic-related sediment. Vehicle traffic would continue displace soils and contribute to some level of erosion and sediment delivery to streams. Two routes with perennial stream crossings would be added to the NFTS. Mitigations to reduce or eliminate erosion, including treatment of stream crossings, are displayed in the Soils and Recreation sections of this chapter.

Route densities would decrease more than 10% in 14 of the 17 watersheds on the east side of the KNF, and in 5 of 11 watersheds on the west side. The most dramatic decreases on the west side are in the Upper Humbug, Middle Humbug, Little Humbug, Lower Humbug, and Clear Creek watersheds, in that order. In the rest of the west side watersheds, there are few unauthorized routes and most of them are short spurs to dispersed recreation sites.

Five acres in Humbug would remain open to cross-country motorized travel in the Humbug open riding area and 48 acres in the Juniper Flat open riding area. Effects would be the same as described under Alternative 2.

Cumulative Effects

Cumulative effects for this alternative are the additive effects of prohibiting cross-country motorized travel on 1.2 million acres, adding 69 miles of unauthorized route to the NFTS, and ongoing and reasonably foreseeable road-related actions. Ongoing and foreseeable actions will add 13 miles of ML 1 road, 26 miles of ML 2 road, and remove 50 miles of road from the NFTS (48 through decommissioning and 2 through conversion to a hiking trail). All but 1 mile of new open road (ML 2) are on the Goosenest Ranger District where hydrologic resources are of minimal concern. All the road removal will occur on the west side of the KNF. Cumulative effects for this alternative would result in a reduction in open route density by 10% or more in 19 of the 28 analyzed watersheds. Ongoing and reasonably foreseeable road-related actions would reduce open road mileage by more than 10% in the one analyzed watershed on the west side that includes road removal. Increases in road density would occur in 8 east side watersheds due to ongoing and reasonably foreseeable actions but the cumulative decrease in road density from the alternative and foreseeable actions would still be more than 10% in 6 of the 8 watersheds. There should be a decrease in fine sediment delivered to streams in all these watersheds. Positive hydrologic trends would be expected. Cumulative effects are summarized in Table H-5. Overall, effects are considered to be beneficial to water resources.

Alternative 6

Direct and indirect effects of prohibition of cross-country motor vehicle travel

The direct and indirect effects of prohibiting cross-country motorized travel are the same as those described under Alternative 2, except they would apply to 438 miles of unauthorized routes (49 miles within riparian reserves).

Direct and indirect effects of adding facilities to the NFTS

This alternative would add 59 miles of roads and motorized trails to the NFTS in analyzed 7th field watersheds, 18 miles within riparian reserves and 6.2 miles in key watersheds, the latter in short spurs to dispersed recreation sites. Evidence of surface erosion was found on almost 13 miles of routes proposed for addition to the NFTS, 2.2 miles of which were in riparian reserves and none in key watersheds. Three routes with perennial stream crossings are proposed for addition to the NFTS.

Routes added to the NFTS would not recover in the short or long term. These routes would continue to intercept and concentrate precipitation and groundwater flow into surface runoff. However, almost 13 miles of routes in Humbug would receive improvement and maintenance (surface compaction, creation of drainage features, etc.) which should reduce the potential for traffic-related sediment. Vehicle traffic would continue displace soils and contribute to some level of erosion and sediment delivery to streams. Mitigations to reduce or eliminate erosion,

including treatment of stream crossings, are displayed in the Soils and Recreation sections of this chapter.

Route densities would decrease more than 10% in 14 of the 17 watersheds on the east side of the KNF, and in 5 of 11 watersheds on the west side. The most dramatic decreases on the west side are in the Upper Humbug, Middle Humbug, Little Humbug, Lower Humbug and Clear Creek watersheds in that order. In the rest of the west side watersheds, there are few unauthorized routes and most of them are short spurs to dispersed recreation sites.

Five acres in Humbug would remain open to cross-country motorized travel in the Humbug open riding area and 48 acres in the Juniper Flat open riding area. Effects would be the same as described under Alternative 2.

Cumulative Effects

Cumulative effects for this alternative are the additive effects of prohibiting cross-country motorized travel on 1.2 million acres, adding 59 miles of unauthorized route to the NFTS, and ongoing and reasonably foreseeable road-related actions. Ongoing and foreseeable actions will add 13 miles of ML 1 road, 26 miles of ML 2 road, and remove 50 miles of road from the NFTS (48 through decommissioning and 2 through conversion to a hiking trail). All but 1 mile of new open road (ML 2) are on the Goosenest Ranger District where hydrologic resources are of minimal concern. All the road removal will occur on the west side of the KNF. Cumulative effects for this alternative would result in a reduction in open route density by 10% or more in 19 of the 28 analyzed watersheds. Ongoing and reasonably foreseeable road-related actions would reduce open road mileage by more than 10% in the one analyzed watershed on the west side. Increases in road density would occur in 8 east side watersheds due to ongoing and reasonably foreseeable actions, but the cumulative decrease in road density from the alternative and foreseeable actions would still be more than 10% in 6 of the 8 watersheds. There should be a decrease in fine sediment delivered to streams in all these watersheds. Positive hydrologic trends would be expected. Cumulative effects are summarized in Table H-5. Overall, effects are considered to be beneficial to water resources.

Alternative 7

Direct and indirect effects of the prohibition of cross-country motor vehicle travel

The direct and indirect effects of prohibiting cross-country motorized travel are the same as those described under Alternative 2, except they would apply to 423 miles of unauthorized routes (47 miles within riparian reserves).

Direct and indirect effects of adding facilities to the NFTS

This alternative would add 74 miles of roads and motorized trails to the NFTS in analyzed 7th field watersheds, 20 miles within riparian reserves and 6.7 miles in key watersheds, the latter in short spurs to dispersed recreation sites. Almost 13 miles of the added routes are in the Butte Valley National Grassland on the east side of the Forest, and thus will not affect hydrologic resources. Evidence of surface erosion was found on about 12 miles of routes proposed for addition to the NFTS, 2.1 miles of which were in riparian reserves and none in key watersheds. One route with a perennial stream crossing is proposed for addition to the NFTS.

Routes added to the NFTS would not recover in the short or long term. These routes would continue to intercept and concentrate precipitation and groundwater flow into surface runoff. However, about 12 miles of routes in Humbug would receive improvement and maintenance (surface compaction, creation of drainage features, etc.) which should reduce the potential for traffic-related sediment. Vehicle traffic would continue displace soils and contribute to some level of erosion and sediment delivery to streams. Mitigations to reduce or eliminate erosion, including treatment of stream crossings, are displayed in the Soils and Recreation sections of this chapter.

Route densities would decrease more than 10% in 13 of the 17 watersheds on the east side of the KNF, and in 5 of 11 watersheds on the west side. The most dramatic decreases on the west side are in the Upper Humbug, Middle Humbug, Little Humbug, Lower Humbug and Clear Creek watersheds in that order. In the rest of the west side watersheds, there are few unauthorized routes and most of them are short spurs to dispersed recreation sites.

Five acres in Humbug would remain open to cross-country motorized travel in the Humbug open riding area and 48 acres in the Juniper Flat open riding areas. Effects would be the same as described under Alternative 2.

Cumulative Effects

Cumulative effects for this alternative are the additive effects of prohibiting cross-country motorized travel on 1.2 million acres, adding 74 miles of unauthorized route to the NFTS, and ongoing and reasonably foreseeable road-related actions. Ongoing and foreseeable actions will add 13 miles of ML 1 road, 26 miles of ML 2 road, and remove 50 miles of road from the NFTS (48 through decommissioning and 2 through conversion to a hiking trail). All but 1 mile of new open road (ML 2) are on the Goosenest Ranger District where hydrologic resources are of minimal concern. All the road removal will occur on the west side of the KNF. Cumulative effects for this alternative would result in a reduction in open route density by 10% or more in 18 of the 28 analyzed watersheds. Ongoing and reasonably foreseeable road-related actions would reduce open road mileage by more than 10% in the one analyzed watershed on the west side that

includes road removal. Increases in road density would occur in 8 east side watersheds due to ongoing and reasonably foreseeable actions but the cumulative decrease in road density from the alternative and foreseeable actions would still be more than 10% in 6 of the 8 watersheds. There should be a decrease in fine sediment delivered to streams in all these watersheds. Positive hydrologic trends would be expected. Cumulative effects are summarized in Table H-5. Overall, effects are considered to be beneficial to water resources.

Summary of Effects Across All Alternatives

Each of the action alternatives would significantly reduce the overall effects of vehicle use on established unauthorized routes due to the prohibition on cross-country travel. Alternative 3 has the greatest positive effect for water resources by prohibiting cross-country motorized travel and disallowing travel on at least 497 miles of unclassified routes.

Differences in indicators between action alternatives, 2, 5, 6 and 7 are slight (Table H-4). Alternative 4, however, proposes very few additional routes, and has impacts comparable to Alternative 3. Based on measurements of route miles added to the system, and the mileage of these routes within riparian reserves and key watersheds, the merits of the remaining alternatives with regards to water resources vary according to the indicator used.

Table H-3. Route density for watersheds with proposed additions to NFTS (densities include state, county, private, NFTS and open unauthorized routes)

7th Field Watershed	Current Route Density (Alt. 1)	Route Density (miles/mile^2)					
		2	3	4	5	6	7
Antelope Sink	3.48	1.94	1.86	1.86	2.06	2.06	2.06
Big Ferry-Swanson	2.37	2.37	2.28	2.28	2.37	2.37	2.37
Bray-Butte Creek	2.79	2.51	2.23	2.23	2.36	2.36	2.36
Buckhorn Creek	4.68	4.35	4.26	4.26	4.30	4.29	4.30
Clear Creek	2.57	1.84	1.41	1.41	1.44	1.44	1.44
Cole-Clauson	2.68	2.68	2.58	2.58	2.68	2.68	2.68
EF SF Salmon Headwaters	1.65	1.65	1.55	1.55	1.65	1.65	1.65
Garner Mountain	3.85	3.00	2.82	2.82	2.86	2.84	2.86
Haight Mountain	4.20	4.13	3.94	4.08	4.08	4.08	4.08
Hill 22	3.40	2.99	2.52	2.87	2.87	2.87	2.87
Kanaka-Olsen	1.61	1.61	1.51	1.61	1.61	1.60	1.61
Little Humbug Creek	3.52	2.51	2.50	2.59	2.59	2.51	2.59
Lower First Creek	4.92	2.84	2.47	2.47	2.47	2.47	2.47
Lower Humbug Creek	2.59	1.99	1.99	2.02	2.02	2.02	2.02
Meiss Lake	2.17	1.91	1.87	1.88	1.88	1.88	2.00
M.F. Humbug Creek	4.59	3.12	2.21	2.42	2.83	2.83	2.80
Mud Lake	3.42	3.23	3.13	3.18	3.18	3.18	3.18
Pollic Flat	3.09	2.74	2.68	2.74	2.74	2.74	2.74
Shafter-Butte Creek	2.42	1.50	1.38	1.41	1.41	1.41	1.41
Sharp Mountain	2.78	2.09	1.69	1.69	1.69	1.69	1.69
Tamarack Flat	3.16	2.41	2.15	2.23	2.23	2.23	2.23
Tennant-Antelope Cr	4.31	3.77	3.53	3.57	3.57	3.57	3.85
Up. First Creek	4.96	4.38	4.32	4.32	4.33	4.33	4.33
Up. Humbug Creek	5.58	3.63	2.65	2.65	4.02	3.81	3.90
Up. Shovel Creek	3.57	2.89	2.87	2.87	2.87	2.87	2.87
Van Bremmer Well	4.62	3.00	2.77	2.77	2.99	2.99	2.99
W. Red Rock Valley	1.74	1.71	1.61	1.61	1.71	1.71	1.71

Table H-4. Comparison of the alternatives on indicators

Indicator	Alt 1	Alt 2	Alt 3	Alt 4	Alt 5	Alt 6	Alt 7
Miles of routes in riparian reserves	67	23	0	0.3	21	18	20
Miles of routes in key watersheds	8.6	7.0	0	0	7.6	6.2	6.7
Miles of routes with existing surface erosion in RRs	2.5	1.6	0	0.3	2.3	2.2	2.1
Road density within 7th field watersheds	No Change or possible increase	Decreases in most watersheds	Decreases in all watersheds	Decreases in most watersheds	Decreases in most watersheds	Decreases in most watersheds	Decreases in most watersheds

Table H-5. Changes in route density for analysis watersheds that have ongoing and reasonably foreseeable road actions (changes due to travel management project plus ongoing and reasonably foreseeable actions)

7th Field Watershed	Ongoing Road-Related Actions		Resulting Road Density by Alternative					
	Additions to NFTS (Miles of open road)	Deletions from NFTS (Miles)	2	3	4	5	6	7
Antelope Sink	10.26	0	2.61	2.53	2.53	2.73	2.73	2.73
Buckhorn Creek	0.22	1.47	4.35	4.26	4.26	4.30	4.29	4.30
Garner Mountain	0.63	0	3.03	2.86	2.86	2.89	2.87	2.89
Lower First Cr.	0.07	0	2.85	2.49	2.49	2.49	2.49	2.49
Pollic Flat	2.49	0	2.88	2.81	2.88	2.88	2.88	2.88
Shafter-Butte Cr.	0.27	0	1.51	1.40	1.43	1.43	1.43	1.43
Tennant-Antelope	3.06	0	4.01	3.77	3.81	3.81	3.81	3.85
Upper First Cr.	0.56	0	4.43	4.37	4.37	4.38	4.38	4.38
Van Bremmer Well	1.80	0	3.21	2.99	2.99	3.20	3.20	3.20

Compliance with the LRMP and Other Direction

1. Clean Water Act

Compliance with the Clean Water Act and the Porter-Cologne Water-Quality Act is achieved through implementation of the action plans for the Scott, Salmon, and draft Klamath River Total Maximum Daily Loads (TMDLs). All action alternatives in the Klamath Travel Management project would help to achieve TMDL requirements by reducing road density, reducing vehicle-generated sediment, and reducing the potential for sediment delivery to streams by subjecting designated routes to improvement and maintenance of running surfaces. This project constitutes a control of sediment waste discharge as required under the Memorandum of Understanding between the Regional Water Quality Control Board and the U.S Forest Service.

Clean Water Act compliance is also achieved by implementing the 1981 management agency agreement with the Water Board and the State of California. The agreement requires the Forest

Service to institute a water quality management program to meet applicable water quality objectives and protect beneficial uses. Under the agreement, implementation of State-approved and Environmental Protection Agency (EPA)-certified Best Management Practices is considered sufficient to protect water quality. Applicable BMPs are identified in the document Klamath Travel BMPs located in the project files.

Activities on the Klamath National Forest are monitored regularly to confirm implementation and effectiveness of BMPs. Annual BMPEP monitoring reports are located in the project files and on the internet at http://www.fs.fed.us/r5/klamath/projects/forestmanagement/index.shtml.

2. Aquatic Conservation Strategy

The LRMP contains the components, objectives and standards and guidelines for the ACS. Of the nine ACS objectives on pages 4-6 and 4-7 of the LRMP, the following are applicable to the travel management project:

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.

The project would facilitate improvement of watershed and landscape-scale conditions by prohibiting travel on 80 percent or more of identified unauthorized roads and trails forest-wide. Those roads and trails brought into the system would receive systematic maintenance.

Maintain and restore spatial and temporal connectivity between watersheds.

None of the alternatives change aquatic access between watersheds as there is not a significant change in flow, nor are barriers created. Prohibiting cross-country motorized travel may prevent some further impacts to spatial and temporal connectivity caused by unauthorized travel through wetted stream channels.

Maintain and restore water quality necessary to support healthy riparian, aquatic, and wetland ecosystems.

This project is consistent with riparian reserve guidelines, which prohibit and regulate activities in the riparian reserves that may prevent or retard attainment of the Aquatic Conservation Strategy. Water quality is expected to improve from pre-project conditions, both forest-wide and by individual watershed. Maintenance of water quality would be achieved by minimizing sediment delivery to stream courses through road improvement actions and prohibiting cross country travel. Wetlands would be avoided.

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

With cross-country travel prohibited in general and specific effects on up to 497 miles of unauthorized roads, some Forest-wide reduction in the load of fine sediments reaching streams is expected.

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

In many 7th field watersheds, reduction of route density may also result in detectable changes in peak flow timing and volume with concomitant reductions in sediment for reasons stated in the body of the report.

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

Any changes in peak flow and timing would be most probably occur on small peaks associated with early season (fall) storm events that are not typically of sufficient volume and duration to affect floodplains.

Maintain and restore the species composition and structural diversity of plant communities in riparian areas.

Species composition of plant communities in riparian areas would be maintained since construction of new roads is not proposed. Prohibiting cross country travel may prevent further impacts to plant communities.

Maintain and restore habitat to support well distributed populations of native plant and invertebrate riparian dependent species.

The action alternatives would prohibit cross-country motorized travel and would not construct new roads; therefore, populations of native plant and invertebrate riparian-dependent species would be protected from crushing and loss of habitat due to unmanaged vehicle use. Action alternatives would result in long-term benefits from habitat recovery on routes that are not designated.

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Fisheries

Introduction

Management of aquatic dependent species and habitat, and maintenance of a diversity of animal communities, is an important part of the mission of the Forest Service (Resource Planning Act of 1974, National Forest Management Act of 1976). Management activities on National Forest System (NFS) lands must be planned and implemented so that they do not jeopardize the continued existence of threatened or endangered species or lead to a trend toward listing or loss of viability of Forest Service sensitive species. Management decisions related to motor vehicle travel can affect aquatic species by increasing human-caused mortality, causing changes in behavior, and modifying habitat (Gaines et al. 2003, Trombulak and Frissell 2000, USDA Forest Service 2000).. The following analysis relates only to fish species and habitat; aquatic species other than fish are discussed in the Terrestrial Wildlife section of this chapter

It is Forest Service policy to minimize damage to vegetation, avoid harassment to wildlife, and avoid significant disruption of wildlife habitat while providing for public motor vehicle use on NFS lands (FSM 2353.03(2)). Therefore, management decisions related to motor vehicle travel on NFS lands must consider effects to fish and their habitat. For purposes of this discussion, the term “fish” is used to include species as well as habitat. Habitat is considered to include both the stream environment and the associated riparian habitat.

Analysis Framework: Statute, Regulation, LRMP, and Other Direction

The Endangered Species Act of 1973 (16 USC 1531 et seq.) states that each Federal agency shall, in consultation with and with the assistance of the Secretary insure that any action authorized, funded, or carried out by such agency is not likely to jeopardize the continued existence of any endangered species or threatened species or result in the destruction or adverse modification of habitat of such species. Section 7 of the ESA, as amended, requires the responsible federal agency to consult the National Marine Fisheries Service concerning threatened or endangered fish species under their jurisdiction. There are three fish species that are listed under the Endangered Species Act on the KNF: Southern Oregon/Northern California Coastal (SONCC) Coho Salmon, Short Nose Sucker, and the Lost River Sucker. In October 2006, Region 5 developed route designation project design criteria for threatened and endangered species and critical habitat to achieve “no effect” or “may affect not likely to adversely affect” determinations on a programmatic level. The Klamath National Forest was included in the programmatic consultation completed with the U.S. Fish and Wildlife Service on December 27, 2006, whereby the Service concurred that by following the criteria described, route designation activities would have no adverse affects.

Forest Service Manual 2670 provides direction regarding Forest Service sensitive species (FSS), which have been identified by the Regional Forester as species for which population viability is a concern. The Forest Service develops and implements management practices to ensure that rare plants and animals do not become threatened or endangered and ensure their continued viability on National Forests. The FSS species on the KNF are Upper Klamath -Trinity Rivers (UKT) Chinook salmon and Klamath Mountains Province (KMP) steelhead trout. It is Forest Service policy to analyze impacts to FSS species to ensure management activities do not create a significant trend toward federal listing or loss of viability. This assessment is documented in the project's Biological Assessment and Biological Evaluation (Fish BA/BE) and is summarized and referenced in this section and available in the project record located at the KNF Supervisor's Office in Yreka, CA.

The **Klamath National Forest Land and Resource Management Plan** identified the following relevant management standards and guidelines for fisheries resources:

6-32 In fish-bearing streams, design new road crossings to maintain a natural stream bottom. Existing low water crossings should be evaluated for impacts on aquatic resources and re-configured as appropriate.

MA10-19 Manage for high quality anadromous fish habitat to meet the following conditions: less than 15% of the stream bottom is composed of fine sediment and less than 20% of stream riffles are embedded (3rd to 5th order streams).

MA10-20 Avoid activities at critical periods that would prevent attainment of the Aquatic Conservation Strategy objectives. Of particular concern are critical low flow periods; when warm water temperatures may result in adverse effects to fish; and during periods of migration, spawning or egg incubation. Discourage activities that may result in disturbance by managing road and trail access through cooperative measures with CDFG [California Department of Fish and Game] and sharing information with the public.

MA10-22 New recreational facilities within RRs, 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 RRs, evaluate and mitigate impact to ensure that these do not prevent and, to the extent practicable, contribute to attainment of Aquatic Conservation Strategy objectives.

MA10-23 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.

MA10-45 Minimize sediment delivery to streams from roads. Road design measures may include minimum impact location, appropriate road surfacing, armoring of ditch-lines, controlled compaction of fills, outsloping of roads, mechanical and vegetative slope protection, wet weather traffic control, annual maintenance and inspection. Outsloping of the road surface is preferred, except in cases where outsloping would increase sediment delivery to streams or where outsloping is unfeasible or unsafe. Route road drainage away from potentially unstable channels, fills, and hillslopes.

MA10-46 Provide and maintain fish passage at all road crossings of existing and potential fish-bearing streams. Construct stream crossings to not divert streamflow out of the channel and down the road alignment.

LRMP standards and guidelines related to water quality are displayed in the Hydrology section of this chapter.

Effects Analysis Methodology

Streams and rivers on the Klamath National Forest support habitat for one threatened or endangered species of fish: SONCC coho salmon; two sensitive species: UKT Chinook salmon and KMP steelhead trout (also a management indicator species); and one additional management indicator species of fish: rainbow trout. The KNF is within the range of two other federally endangered species (shortnose sucker and Lost River sucker) but does not provide habitat for either species, and the travel management project area is outside the range of both species. Project design criteria for both sucker species from the Pacific Southwest Region (Region 5) Programmatic BA/BE for Travel Management were applied and documentation is filed in the project record located at the KNF Supervisor's Office in Yreka, CA. The project will have no effect to either sucker species or their habitat; therefore these two species are not addressed further in this document. On January 16, 2010, National Marine Fisheries Service agreed that a preliminary "may affect not likely to adversely affect" (MANLAA) effects determination is warranted for the proposed action and preferred alternative for SONCC Coho Salmon.

Riparian Reserves, used for assessing potential effects to fish, are portions of watersheds where riparian-dependent resources receive primary emphasis and where special standards and guidelines apply. Standards and guidelines prohibit and regulate activities in RRs that retard or

prevent attainment of the Aquatic Conservation Strategy objectives. Riparian reserves are important because they include the habitat fish need and use, in whole or in part.

Stream crossings that were included in action alternatives were initially identified through GIS mapping, validated through aerial photography, and those that were associated with Alternatives 2, 4, 5, 6 and 7 were field reviewed to verify (1) whether the route actually crossed the channel, (2) whether the channel carried water on a perennial or intermittent basis or was an ephemeral stream, and (3) whether the stream crossing had the potential to affect aquatic habitat.

Assumptions Specific to the Fisheries Analysis

- All vehicle types result in the same amount of disturbance effect on aquatic dependent species.
- Habitat is being affected to some degree by the cross-country motorized travel. Where motorized use is prohibited, riparian habitats will improve over the long term due to passive restoration and revegetation.
- The density of routes at the watershed scale will not be substantially changed in the short term as a result of any of the action alternatives because of the time required for passive restoration (self-decommissioning) of routes.
- The effect of roads on fish habitat is related to the amount of sediment movement from road surfaces to water resources, and is highly variable within and among surface types. Sediment movement is related to levels of maintenance, road drainage, and amount of use of the road.
- Routes without hydrologic connectivity to streams will not influence sedimentation rates and will have no effect on water quality and, therefore, no effect on fisheries.
- Routes outside of riparian reserves will not influence the aquatic environment, or will not have negative impacts on fish or their habitat.
- Motor vehicle use on the Klamath National Forest is very low. It is unlikely that effects of road use will be measurable or discernable from the multiple natural and human-induced changes that occur over the landscape on the KNF.

Data Sources

- GIS layers of the following information: routes; anadromous and resident fish habitat; and RRs.
- Site-specific surveys/assessment of any localized sensitive aquatic habitats with routes proposed to be added to the NFTS (e.g., wet meadows, stream crossings, and RRs).

Indicators

- Road density by 7th field watershed.
- Miles of unauthorized routes (Alternative 1) or routes proposed for addition to the NFTS within RRs (action alternatives).
- Acres of RRs with unauthorized routes (Alternative 1) or with proposed additions to the NFTS (action alternatives).
- Miles of routes proposed for addition to the NFTS within known or historically occupied habitats of threatened, endangered, sensitive (TES) or management indicator species (MIS).
- Habitat Indicators for fish habitat are:
    - Risk of Sediment Delivery – measured by in-channel embeddedness
    - Stream Temperature
    - Migration barriers

Fisheries Resource Methodology by Action

1. Direct and indirect effects of the prohibition of cross-country motor vehicle travel

Short-term timeframe: 1 year.

Long-term timeframe: 20 years.

Spatial boundary: Seventh field watersheds with TES and MIS fish habitat that include unauthorized routes.

Indicators: All but one of the indicators were used (miles of routes proposed for addition to the NFTS within known or historically occupied habitats of TES or MIS fish species does not make sense for this action).

Methodology: GIS analysis and field assessment of unauthorized routes in relation to fish habitat and RRs were used to evaluate all project elements and effects of project elements to the indicators.

2. Direct and indirect effects of adding facilities to the NFTS

Short-term timeframe: 1 year.

Long-term timeframe: 20 years.

Spatial boundary: Seventh field watersheds with TES and MIS fish habitat that include unauthorized routes proposed for addition to the NFTS.

Indicators: All indicators were used.

Methodology: GIS analysis and field assessment of unauthorized routes proposed for addition to the NFTS in relation to fish habitat and RRs were used to evaluate all project elements and effects of project elements to the indicators.

3. Direct and indirect effects of changes to the NFTS

Changes in the type of vehicles using roads will not affect fisheries resources; therefore, this action will not be addressed further in this section.

4. Cumulative effects

Short-term timeframe: not applicable; cumulative effects analysis will be done only for the long-term time frame.

Long-term timeframe: 20 years.

Spatial boundary: Seventh field watersheds with TES and MIS fish habitat.

Indicators: All indicators were used.

Methodology: GIS analysis of ongoing and foreseeable actions added to the effects of each alternative.

A number of different management activities have the potential to affect fish habitat. However, road-related activities (construction or decommissioning) generate impacts to soils and riparian areas that could result in changes to sediment delivery to streams. Therefore, ongoing and reasonably foreseeable road-related actions that may affect the three TES anadromous fish species and the MIS are addressed in the cumulative effects section of this analysis.

Affected Environment

One Threatened species of fish (SONCC coho salmon), two FSS species (UKT Chinook salmon and KMP Steelhead trout), and both management indicator species (MIS) will be addressed here. The SONCC coho salmon, UKT Chinook salmon, and KMP Steelhead trout and their habitats on the KNF are described in detail in the Biological Assessment/ Biological Evaluation (Fish BA/BE). Rainbow trout are discussed in the KNF Motorized Travel Management MIS Report. Both are hereby incorporated by reference and can be found in the project record located in the Supervisor's Office in Yreka, California.

The ranges of fish species overlap with one another. Therefore, the miles of fish habitat (and miles of unauthorized routes within habitat) shown for each species can include the ranges (and miles) of other fish species. The range for the rainbow trout is the most extensive because trout occupy habitat above barriers (such as waterfalls and some culverts) that prevent the movement of anadromous fish (salmon and steelhead). The miles of fish habitat, and routes within this habitat, cannot be added to one another as one is a subset of another. Anadromous fish species exist only on the west side of the KNF while rainbow trout species and habitat exist on both the east and west sides of the Forest. Table F-1 displays the miles of unauthorized routes within the known or historically occupied habitat on the KNF.

Table F-1. KNF threatened, sensitive, and management indicator species of fish

Common Name	Scientific Name	Status	Miles of unauthorized routes within known or historically-occupied fish habitat
SONCC Coho Salmon	*Oncorhynchus kisutch*	Federally Threatened	14.6
UKT Chinook salmon	*Oncorhynchus tshawytscha*	Forest Sensitive	10.4
KMP Steelhead trout	*Oncorhynchus mykiss*	Forest Sensitive, MIS	14.7
Rainbow Trout	*Oncorhynchus mykiss*	MIS	38.1 (14.7 east, 23.4 west)

The Klamath National Forest covers an area of 1.7 million acres located in Siskiyou County, Northern California and Jackson County, Oregon. Effects from dam construction, catastrophic floods, natural landslides and fires, over-harvest of fish, and human activities on the landscape including timber harvest, off-road travel, flow management, mining, and domestic livestock grazing have affected habitat quality and population levels of fish. Because 1.2 million acres of the KNF are currently open for off-road use, unmanaged motorized vehicle use has resulted in unplanned, unauthorized routes throughout the Forest, most located on the flatter terrain of the east side of the Forest. There are a total of four hundred nine 7th field watersheds on the KNF, 330 on the west side and 79 of the east side. All of the east side watersheds and 285 of the 7th field watersheds on the west side include unauthorized routes. Because of the importance of anadromous fish and associated habitat, most emphasis in the following discussion is on the west side. Rainbow trout habitat will be discussed separately for the east side of the KNF (Goosenest Ranger District).

Key watersheds identified by the KNF LRMP exist only on the west side and include the following 5th field watersheds: Clear Creek, Elk Creek, Dillon Creek, Grider Creek, Wooley Creek, Main Salmon, North Fork Salmon River, Lower South Fork Salmon River, and Upper South Fork Salmon River (USDA Forest Service 1995). Within these 5th field Key Watersheds are one hundred thirty three 7th field watersheds. Relatively few miles of unauthorized routes exist in these watersheds; 4 of the 9 key watersheds are partially or wholly within wilderness. There are no miles of unauthorized routes within the known or historically occupied fish habitat

for threatened, endangered or sensitive fish species in these key watersheds. Some alternatives propose to add a small number of miles of unauthorized routes to dispersed recreation sites to the NFTS, especially in the Kanaka-Olsen and East Fork South Fork Salmon Headwaters 7th field watersheds, but not within known or historically occupied fish habitat for TES or MIS fish, so Key watersheds are not addressed further in this document.

About 60 miles of unauthorized routes are located within RRs on the west side of the KNF, and 7 miles on the east side. While these routes are within RRs, most are not immediately adjacent to the stream channel. Other than at crossings, riparian vegetation separates the route from the stream, providing a buffer to movement of sediment into the channel. The DEIS identified 29 stream channel crossings associated with unauthorized routes based on GIS data. Photographic and field-based review of the crossings on routes proposed for addition to the NFTS found that less than ½ of them actually were stream crossings. Field-verified numbers of crossings are used in the FEIS analysis.

Some alternatives propose to add an access route that leads to a dispersed recreation site in the Long John Creek 7th field watershed, which supports anadromous fish habitat. The route proposed to be added is very short (0.06 miles), is located in the upper elevations of the watershed away from perennial streams, and does not affect riparian vegetation, TES fish, MIS fish or their habitat. This watershed is not addressed further in this document.

There are five 7th field watersheds on the west side of the KNF where the proposed action or alternatives may affect TES or MIS fish and their habitat. Upper Humbug, Middle Fork Humbug, and Lower Humbug have anadromous fish habitat located adjacent to or immediately downstream (0.0 to 0.3 miles) of unauthorized routes being proposed for addition to the NFTS in one or more action alternatives. Little Humbug Creek and Buckhorn Creek have anadromous fish habitat located 0.75 miles downstream from unauthorized routes being proposed for addition to the NFTS in one or more action alternatives. The routes proposed to be added In Little Humbug and Buckhorn are very short, are located in the upper elevations of the watershed away from perennial streams, and do not affect riparian vegetation, anadromous fish or their habitat.

These watersheds all exhibit varying amounts of checkerboard ownership, with interspersed federal and private land. Past disturbances include wildfire, timber harvest (with associated roads), mining, and grazing. The watersheds in the Humbug area in particular have sustained a great deal of human modification, and have granitic soils that have high erosion ratings (see discussion in the Soils section). Effects from past activities are reflected in the current condition descriptions. Most stream channels are stable or in the process of stabilizing. The upper portions of these watersheds are primarily in public ownership and generally exhibit low to moderate levels of disturbance. The lower portions exhibit a high level of disturbance due to vegetation management activities conducted on large parcels of private lands. The watersheds are used for a

variety of recreation activities, primarily sightseeing and camping. Motorized access to sites for these activities is important and the watersheds also get some use by off-highway vehicles (OHVs). Most OHV use on the west side is limited by topography to NFTS roads.

Stream temperatures and riparian reserves are considered to be "At Risk" in the lower elevations of the five watersheds due to reduced amounts of riparian vegetation along the stream channels located on private land. The fine silt and sand found in many of the lower stream reaches indicates that suspended sediment has been high in recent years. Some embeddedness is evident but it is not severe. The analysis area tributaries undergo a few days of turbidity after thunderstorms. Watershed-specific conditions are provided below.

Upper Humbug Creek: Embeddedness is high and above the maximum desired level of 20 percent as defined in the Forest Plan. The high levels of embeddedness are likely due to the large amounts of silt and sand present in the upper portions of this watershed. The mainstem channel banks are generally stable and well vegetated. The riparian reserves are considered properly functioning. Stream temperature is considered properly functioning.

Middle Fork Humbug Creek: Embeddedness is moderate and above the maximum desired level of 20 percent as defined in the Forest Plan. The mainstem channel banks are generally stable and well vegetated. The riparian reserves are considered properly functioning. Stream temperature is considered properly functioning.

Lower Humbug Creek: Embeddedness is moderate and above the maximum desired level of 20 percent as defined in the Forest Plan. The moderate levels of embeddedness are likely due to the large amounts of silt and sand present in the upper portions of this watershed. The mainstem channel banks are generally stable and well vegetated. The riparian reserves are considered properly functioning on federal land and at risk on private land. Stream temperature is considered properly functioning. Concerns regarding current soil conditions, drainage issues, and effects from past activities in this watershed are outlined in the Geologic and Soil Resources sections.

Little Humbug Creek: The riparian reserves are considered at risk primarily due to vegetation impacts from past fire and mining activities. No stream temperature data or stream survey data are available.

Buckhorn Creek: The reaches vary in stability due to some unstable slopes adjacent to the channel. There are less fines in tributaries further upstream, reflecting a smaller number of upstream road crossings higher in the drainage, however fine sediment is still evident. Embeddedness is moderate but above the maximum desired level of 20 percent as defined in the LRMP. Riparian reserves are considered to be properly functioning on federal land at risk on private land.

Table F-2 displays current conditions in the 5 watersheds by indicator.

Table F-2. Fisheries Indicators for all alternatives – current situation

7th Field Watershed	Indicator				
	Road Densitymi/sq mi		Sediment (Measured by Embeddedness)	Stream Temperature (in Celsius)	Man-made Barriers to Anadromous fish migration
	NFTS, state, county, and private roads	All open roads and routes (includes unauthorized routes)			
Upper Humbug Creek	2.65	5.58	48%	16.0	None
Lower Humbug Creek	1.99	2.59	32%	17.9	Possibly on private land (SONCC coho salmon).
Little Humbug Creek	2.50	3.52	No data	No data	None
Buckhorn Creek	4.34	4.68	38%	16.2	None
Middle Fork Humbug Creek	2.21	4.59	27%	16.9	None

Environmental Consequences

Direct effects for this project could occur where vehicles drive through a stream crossing that is occupied by TES or MIS fish species. Literature indicates that placement of routes in relation to habitat can affect aquatic species through mortality, disturbance, and habitat modification (Moyle and Randall 1996; Trombulek and Frissell 2000; USDA Forest Service 2000). Susceptibility to direct effects is dependent on the life history stage of the fish species present. For example, eggs of resident and anadromous fish species in redds are more susceptible to direct effects because they cannot move, whereas the juvenile and adult stages of resident and anadromous fish species can move.

Indirect effects for this project include changes in fish habitat over time as evaluated by the indicators. The primary impact to stream systems, and consequentially the species that inhabit them, is from sediment moving into the water from native-surfaced roads. While many routes are hardened and self-maintaining, some are located in highly erodible soils or are subject to drainage problems. This can lead to increased amounts of water being captured and, if there is hydrologic connectivity, diverted into streams. Turbidity resulting from sediment movement into streams can negatively affect fisheries resources, including invertebrates and fish (Sigler et al., 1984). The use of unauthorized routes in and near watercourses can alter hydrologic function and contribute to increased sedimentation in streams. If motor vehicles are in direct contact with waterways (such as at stream crossings) impacts of use may include breaking down and erosion from stream banks and, therefore, increased sediment delivery to watercourses. Increased sedimentation and

turbidity may increase the metabolic rate, respiration, and oxygen demands of fish and amphibians (Jennings 1996).

Alternative 1

Direct and indirect effects of the prohibition of cross-country motor vehicle travel

Direct effects may be occurring to the young life stages of anadromous fish and resident rainbow trout from vehicle movement through stream channels. These effects could increase if the number of stream crossings increases due to the creation of new unauthorized routes. The actual extent to which fish could be affected in the long term under the no action alternative cannot be quantitatively assessed because of the unknown potential for expansion of the unauthorized route system.

Road density

Road densities will remain at current levels in the short term, but could or increase if new unauthorized routes are created.

Riparian Reserves

Vehicles operating within RRs can directly affect the riparian vegetation by damaging plants (if vehicles are off a designated route) or disturbing or removing soil, thereby inhibiting plant growth. Damage to riparian vegetation from unmanaged off-road travel on roads located within riparian reserves would continue and could increase due to new routes being created in riparian reserves. The effects of this action would be similar for all alternatives, but the intensity would be different depending on the extent of the impact, related to the density of routes within a defined area. Impacts include loss or reduction of habitat for terrestrial insects that fish eat, loss or reduction of stream shade, and reduction in thermal buffering in the riparian area.

The 67 miles (134 acres) of existing unauthorized routes within riparian reserves will continue to receive use and would not be expected to recover in the short or long term. Miles of unauthorized routes in RRs and affected acres could increase due to new routes being created from cross-country motor travel.

Routes existing/proposed within known or historically occupied habitat

At least 14.6 miles of open unauthorized routes will continue to affect habitat for SONCC coho salmon, 10.4 miles for UKT Chinook salmon, and 14.7 miles for KMP steelhead. Habitat for rainbow trout on the west side would continue to be affected by vehicle use on 23.4 miles of unauthorized routes on the west side of the KNF and 14.7 miles on the east side.

Sediment

Fine grained sediments from road crossings and dust particles from nearby roads can settle in a stream and lodge in interstitial spaces between larger substrate, filling in the areas inhabited by stream dwelling insects, and thereby reducing the available food for trout and other fish. The plugging of these spaces also inhibits the flow of water through the substrate, inhibiting the oxygenating and cleansing properties of flowing water that enables fish eggs and alevin to develop. This condition would reduce the amount of habitat available to fish for reproduction, and could reduce the number of fish in the stream.

Most routes within riparian reserves are separated from the stream channel by riparian vegetation. Riparian reserves in 4 of the 5 watersheds analyzed for effects on anadromous fish for this project have been determined to be properly functioning, and act as buffers to any sediment generated by vehicle travel on roads located within known or historically occupied habitat for the 4 fish species. However, unmanaged off-road travel on routes located in highly erodible soils that have drainage problems have a high likelihood of contributing sediment to stream channels. New routes and stream crossings could be created that would also deliver sediment stream channels. None of the new or existing routes, or the 14 stream crossings on those routes, would recover vegetatively, and sediment delivery to stream channels from these routes would continue. Embeddedness would remain at existing levels, or possibly increase if new routes and crossings are created.

There are no sedimentation issues for routes on the east side of the Forest, so there would be no sediment impacts to resident trout on the Goosenest District.

Stream Temperature

Removal of riparian vegetation could negatively affect stream shading. Most of the unauthorized routes are not immediately adjacent to streams, and do not currently affect shading. Effects to stream temperature from any newly-created routes would be expected to be minimal due to the low-growing nature of vegetation that could be affected by vehicles.

Barriers

New barriers to fish migration could result due to new unauthorized routes being established in stream channels. As channels are widened, streamflow is spread out andwater depths could become insufficient for fish passage. This could adversely affect the three anadromous fish species and MIS fish species.

Direct and indirect effects of adding facilities to the NFTS

Alternative 1 does not add roads, trails, or open riding areas to the NFTS. There are no direct or indirect effects to the four fish species from this action.

Cumulative Effects

For this alternative, cumulative effects are the effects of cross-country motorized travel and use of 497 miles of unauthorized routes, added to the effects from ongoing and foreseeable actions listed in Appendix B. Construction of 1 mile of new ML 2 road and 1.8 miles of ML 1 road, and removal of 50 miles of road from the NFTS (48 miles through decommissioning and 2 miles through conversion to a hiking trail) are proposed for the west side of the Forest, where anadromous fish and most rainbow trout habitat occurs, for a net reduction of 49 miles of ML 2 road. The effects of these projects to water quality are analyzed in the environmental analysis and disclosure for each project. In the long term, there will be some benefit from decommissioning 48 miles of road; however, the beneficial effects of these ongoing and reasonably foreseeable actions would be counterbalanced by the potentially adverse effects of continued use of unauthorized routes, and continued cross-country travel by motorized vehicles.

Alternative 2

Direct and indirect effects of the prohibition of cross-country motor vehicle travel

No direct effects to the young life stages of the four fish species will occur from vehicle movement through stream channels. No new unauthorized routes would be created, which will eliminate the potential for direct effects occurring in the future.

Road density

Unmanaged off-road travel would be eliminated from 1.2 million acres, reducing open road density in all one hundred and eighty-eight 7th field watersheds in which unauthorized routes exist, including the 5 watersheds analyzed for effects on anadromous fish.

Riparian reserves

In both the short term and long term, soil disturbance in riparian reserves from unmanaged off-road vehicle use would be reduced on 44 miles of unauthorized routes where cross-country motor travel would be prohibited. In the long term, soils on 88 acres in riparian reserves will slowly decompact, and the routes will revegetate, resulting in beneficial effects to riparian conditions.

Routes existing/proposed within known or historically occupied habitat

Motorized use would be removed from 7.4 miles of unauthorized routes within SONCC coho salmon habitat, 4 miles in UKT Chinook salmon habitat, 5.9 miles in KMP steelhead trout habitat, and 11.7 miles in rainbow trout habitat. There would be no new unauthorized routes created, and the unauthorized routes within anadromous fish and rainbow trout habitat should slowly recover in the long term through passive restoration once motorized vehicle use ceases.

Sediment

Most routes within riparian reserves are separated from the stream channel by riparian vegetation. Riparian reserves in 4 of the 5 watersheds analyzed for effects on anadromous fish have been determined to be properly functioning, and will act as buffers to any sediment generated by vehicle travel on roads located within known or historically occupied habitat for the 4 fish species. However, removing vehicle use from 44 miles of unauthorized routes in riparian reserves will eliminate soil displacement on those routes and at 12 stream crossings. Sediment delivery from these routes to stream channels should decrease. No new routes or stream crossings would be created. Embeddedness will not increase, and may decrease over time as sediment input declines, which would be a long term benefit to fish and fish habitat.

Stream temperature

Damage to riparian vegetation from unmanaged off-road travel on roads located within riparian reserves would be reduced on 44 miles (88 acres) of unauthorized routes. Most of these routes are not immediately adjacent to streams, so that revegetation will have minimal effects on stream shading. There will be a neutral effect to stream temperature.

Barriers

No new barriers to fish migration would be created since no new unauthorized routes would be created.

Direct and indirect effects of adding facilities to the NFTS

Direct effects would involve crushing of fish or eggs at stream crossings accessible by vehicles, although most fish can evade tires at crossings. This alternative proposes two crossings in Middle Fork Humbug Creek, which are upstream of coho salmon habitat but within habitat for steelhead and rainbow trout. No spawning habitat is present at either crossing so no direct effects to anadromous fish or resident rainbow trout redds or eggs are expected. Effects are considered to be insignificant for fish. These sites have been evaluated by fisheries biologists for both the Forest Service and National Marine Fisheries Service, and effects are addressed in the BA/BE.

Sediment

Effects to sediment are expected to be insignificant in the short term and beneficial in the long term for the following reasons:

- Two perennial stream crossings (one in the Humbug drainage and one in Long John Creek) would be rocked to reduce the potential for sedimentation.

- Most routes within riparian reserves are separated from the stream channel by riparian vegetation. Riparian reserves in 4 of the 5 watersheds analyzed for effects on anadromous fish have been determined to be properly functioning, and will act as buffers to any sediment generated by vehicle travel on roads located within known or historically occupied habitat the 4 fish species.

- The contribution to sediment loading from these routes is considered insignificant, and is immeasurable at the 7th field watershed scale.

- Routes within riparian reserves that are added to the NFTS will receive maintenance as needed to ensure that they do not contribute sediment to adjacent streams.

Field review of the Humbug area has resulted in site-specific mitigations that will be completed prior to the area being open for public use. About 9 miles of routes in Humbug would be improved, and mitigations include construction of drainage features, surface blading, and signing to encourage riders to remain on the established trails. These measures will reduce the amount of sedimentation from these routes over the long term. Mitigation measures are displayed in the Soils and Recreation sections of this chapter.

Sixty-five acres of open riding area (60 acres at Juniper Flat and 5 acres in the Humbug open riding area), in which cross-country motorized travel would not be prohibited, would be available for use. The watersheds on which Juniper Flat is situated do not have perennial water and do not drain into fish-bearing streams; there will be no impact on fish or fish habitat from this open riding area. The Humbug open riding area is adjacent to an NFTS road, and consists of hills that drain into a large flat that lies below the level of the road. There is no riparian vegetation within the riding area. Although this area is within a riparian reserve, it is not hydrologically connected to a stream. Continued use of this area by OHVs should not affect anadromous fish, resident rainbow trout or their habitat.

Routes existing/proposed within known or historically occupied habitat

Motorized use would continue on 7.2 miles of existing routes within SONCC habitat, 6.4 miles in UKT habitat, 8.8 miles in steelhead habitat, and 11.7 miles in rainbow trout habitat. The effects on fish habitat of continued motorized use of these routes is considered to be insignificant. The routes are distributed over numerous watersheds; their cumulative contribution to sediment loading would be immeasurable at the 7th field watershed scale.

Riparian reserves/Stream temperature

This alternative designates 23 miles of roads (46 acres) within riparian reserves, most of which are not immediately adjacent to the stream channel. They are primarily short, rough-graded spurs from which vegetation has already been removed. Regrowth of vegetation on these routes would

not provide a significant contribution to stream shading, so there will be a neutral effect to stream temperature and an insignificant effect to riparian reserves.

Barriers

No barriers to fish migration would be created. The two existing stream crossings in the Middle Fork Humbug Creek drainage are not currently barriers to fish migration, and the rocking work will be done so that fish passage is not hindered.

Cumulative Effects

Cumulative effects are the effects of prohibiting cross-country travel on 1.2 million acres and addition of unauthorized routes to the NFTS, added to the effects from the ongoing and foreseeable road-related actions (Appendix B).

This project would add 92 miles of routes to the NFTS; ongoing and foreseeable road-related actions would add 13 miles of ML 1 roads and 26 miles of ML 2 roads and motorized trails to the NFTS, and remove 50 miles of road (48 miles through decommissioning and 2 miles through conversion to a hiking trail). ML 1 roads will be closed to motorized vehicle traffic and, thus, should not produce effects on fish habitat. These activities would result in a net increase of about 68 miles of open road forest-wide. However, most of the increase will occur on the east side of the Forest. On the west side of the Forest, where anadromous fish habitat occurs, the combination of this alternative and ongoing and foreseeable projects results in the addition of about 40 miles of ML 2 roads and motorized trails, and removal of 50 miles of roads from the NFTS, a net decrease of about 10 miles. Effects will be dispersed across 86 watersheds on the west side and 48 on the east side; effects will not be measurable at the watershed scale. There will be a substantial benefit from removing vehicle use from 1.2 million acres of lands.

Alternative 3

Direct and indirect effects of prohibition of cross-country motor vehicle travel

No direct effects to the young life stages of the four fish species will occur from vehicle movement through stream channels. No new unauthorized routes would be created, which will eliminate the potential for direct effects occurring in the future.

Road density

Unmanaged off-road travel would be eliminated from 1.2 million acres, reducing open road density in all one hundred and eighty-eight 7th field watersheds in which unauthorized routes exist (including the 5 watersheds analyzed for effects on anadromous fish (Table F-4).

Riparian reserves

In both the short term and long term, soil disturbance in riparian reserves from unmanaged off-road vehicle use would be reduced on 67 miles of unauthorized routes where cross-country motor travel would be prohibited. In the long term, soils on 134 acres in riparian reserves will slowly decompact, and the routes will revegetate, resulting in beneficial effects to riparian conditions.

Routes existing/proposed within known or historically occupied habitat

Motorized use would be removed from 14.6 miles of unauthorized routes within SONCC coho salmon habitat, 10.4 miles in UKT Chinook salmon habitat, 14.7 miles in KMP steelhead trout habitat, and 23.4 miles in rainbow trout habitat. There would be no new unauthorized routes created, and the unauthorized routes within anadromous fish and rainbow trout habitat should slowly recover in the long term through passive restoration once motorized vehicle use ceases.

Sediment

Most routes within riparian reserves are separated from the stream channel by riparian vegetation. Riparian reserves in 4 of the 5 watersheds analyzed for effects on anadromous fish have been determined to be properly functioning, and will act as buffers to any sediment generated by vehicle travel on roads located within known or historically occupied habitat for the 4 fish species. However, removing vehicle use from 67 miles of unauthorized routes in riparian reserves will eliminate soil displacement on those routes and at 14 stream crossings. Sediment delivery from these routes to stream channels should decrease. No new routes or stream crossings would be created. Embeddedness will not increase, and may decrease over time as sediment input declines, which would be a long term benefit to fish and fish habitat.

Stream temperature

Damage to riparian vegetation from unmanaged off-road travel on roads located within riparian reserves would be reduced on 67 miles (134 acres) of unauthorized routes. Most of these routes are not immediately adjacent to streams, so that revegetation will have minimal effects on stream shading. There will be a neutral effect to stream temperature.

Barriers

No barriers to fish migration would be created since no new unauthorized routes would be created.

Direct and indirect effects of adding facilities to the NFTS

No facilities would be added to the NFTS under this alternative.

Cumulative effects

This alternative does not add mileage to the NFTS; therefore, cumulative effects of this project are the added effects of the prohibition of cross-country travel on 1.2 million acres and the ongoing and foreseeable road-related actions. Effects of the prohibition are described above.

On the west side of the Forest, where anadromous fish habitat occurs, ongoing and foreseeable projects include construction of 1 mile of ML 2 road and 1.8 miles of ML 1 road, and removal of 50 miles of road from the NFTS, a net reduction of 49 miles of ML 2 road. ML 1 roads will be closed to motorized vehicle traffic and, thus, should not produce effects on fish habitat. The effects from the ongoing and foreseeable road-related projects will be beneficial to anadromous fish, resident rainbow trout and their habitat.

Alternative 4

Direct and indirect effects of prohibition of cross-country motor vehicle travel

No direct effects to the young life stages of the four fish species will occur from vehicle movement through stream channels. No new unauthorized routes would be created, which will eliminate the potential for direct effects occurring in the future.

Road density

Unmanaged off-road travel would be eliminated from 1.2 million acres, reducing open road density in all one hundred and eighty-eight 7th field watersheds in which unauthorized routes exist, including the 5 watersheds analyzed for effects on anadromous fish (Table F-4).

Riparian Reserves

In both the short term and long term, soil disturbance in riparian reserves from unmanaged off-road vehicle use would be reduced on almost 67 miles of unauthorized routes where cross-country motor travel would be prohibited. In the long term, soils on 133 acres in riparian reserves will slowly decompact, and the routes will revegetate, resulting in beneficial effects to riparian conditions.

Routes existing/proposed within known or historically occupied habitat

Motorized use would be removed from 14.6 miles of unauthorized routes within SONCC coho salmon habitat, 10.4 miles in UKT Chinook salmon habitat, 14.5 miles in KMP steelhead trout habitat, and 23.2 miles in rainbow trout habitat. There would be no new unauthorized routes created, and the unauthorized routes within anadromous fish and rainbow trout habitat should slowly recover in the long term through passive restoration once motorized vehicle use ceases.

Sediment

Most routes within riparian reserves are separated from the stream channel by riparian vegetation. Riparian reserves in 4 of the 5 watersheds analyzed for effects on anadromous fish have been determined to be properly functioning, and will act as buffers to any sediment generated by vehicle travel on roads located within known or historically occupied habitat for the 4 fish species. However, removing vehicle use from almost 67 miles of unauthorized routes in riparian reserves will eliminate soil displacement on those routes and at 13 stream crossings. Sediment delivery from these routes to stream channels should decrease. No new routes or stream crossings would be created. Embeddedness will not increase, and may decrease over time as sediment input declines, which would be a long term benefit to fish and fish habitat.

Stream temperature

Damage to riparian vegetation from unmanaged off-road travel on roads located within riparian reserves would be reduced on almost 67 miles (133 acres) of unauthorized routes. Most of these routes are not immediately adjacent to streams, so that revegetation will have minimal effects on stream shading. There will be a neutral effect to stream temperature.

Barriers

No new barriers to fish migration would be created since no new unauthorized routes would be created.

Direct and indirect effects of adding facilities to the NFTS

Direct effects would involve crushing of fish or eggs at stream crossings accessible by vehicles, although most fish can evade tires at crossings. This alternative proposes one crossing in Middle Fork Humbug Creek, upstream of coho salmon habitat but within habitat for steelhead and rainbow trout. No spawning habitat is present at the crossing so no direct effects to anadromous fish or resident rainbow trout redds or eggs are expected. The site has been evaluated by fisheries biologists for both the Forest Service and National Marine Fisheries Service, and effects are addressed in the BA/BE. Effects are considered to be insignificant for fish.

Sediment

Effects to sediment are expected to be insignificant in the short term and beneficial in the long term for the following reasons:

- One perennial stream crossing in the Humbug drainage would be rocked to reduce the potential for sedimentation.
- Two proposed routes within riparian reserves are separated from the stream channel by riparian vegetation, which will serve as a buffer to any sediment generated by vehicle travel.

- The contribution to sediment loading from these routes is considered insignificant, and is immeasurable at the 7th field watershed scale.
- Routes within riparian reserves that are added to the NFTS will receive maintenance as needed to ensure that they do not contribute sediment to adjacent streams.

Routes existing/proposed within known or historically occupied habitat

Only 0.2 mile of unauthorized routes within KMP steelhead trout habitat would still be available for motorized use. The effects of this small amount of use would not be measurable at the watershed scale.

Riparian Reserves/Stream Temperature

This alternative includes the addition of 2 routes (0.4 mile, <1 acre) to the NFTS within riparian reserves. One is a river access point on the Klamath River, the other is a short route with a stream crossing on Middle Fork Humbug Creek upstream from coho salmon habitat but within resident rainbow trout and steelhead habitat. This site has been evaluated by fisheries biologists for both the Forest Service and National Marine Fisheries Service, and effects are addressed in the BA/BE. Regrowth of vegetation on these routes would not provide a significant contribution to stream shading, so there will be a neutral effect to stream temperature and an insignificant effect to riparian reserves.

Barriers

No barriers to fish migration would be created. The existing stream crossing in the Middle Fork Humbug Creek drainage is not a barrier to fish migration, and the rocking work will be done so that fish passage is not hindered.

Cumulative effects

Less than one mile of route on the west side of the KNF (where anadromous fish habitat occurs) would be added to the NFTS under this alternative. In combination with the 1 mile of ML 2 road and 1.8 miles of ML 1 road added by ongoing and reasonably foreseeable actions, and the 50 miles of NFTS road removed by such actions, the cumulative effects of this alternative would be beneficial to fish. The differences between Alternative 4 and Alternative 3 are miniscule and cumulative effects are considered to be essentially the same as those described for Alternative 3.

Alternative 5

Direct and indirect effects of prohibition of cross-country motor vehicle travel

No direct effects to the young life stages of the four fish species will occur from vehicle movement through stream channels. No new unauthorized routes would be created, which will eliminate the potential for direct effects occurring in the future.

Road Density

Unmanaged off-road travel would be eliminated from 1.2 million acres, reducing open road density in all one hundred and eighty-eight 7th field watersheds in which unauthorized routes exist, including the 5 watersheds analyzed for effects on anadromous fish (Table F-4).

Riparian Reserves

In both the short term and long term, soil disturbance in riparian reserves from unmanaged off-road vehicle use would be reduced on 46 miles of unauthorized routes where cross-country motor travel would be prohibited. In the long term, soils on 92 acres in riparian reserves will slowly decompact, and the routes will revegetate, resulting in beneficial effects to riparian conditions.

Routes existing/proposed within known or historically occupied habitat

This alternative would eliminate motorized use on 11.0 miles of unauthorized routes within SONCC habitat, 9.1 miles of unauthorized routes within UKT habitat, 12.4 miles of unauthorized routes within KMP steelhead habitat, and 14.2 miles of unauthorized routes within rainbow trout habitat. There would be no new unauthorized routes created, and the unauthorized routes within anadromous fish and rainbow trout habitat should slowly recover in the long term through passive restoration once motorized vehicle use ceases.

Sediment

Most routes within riparian reserves are separated from the stream channel by riparian vegetation. Riparian reserves in 4 of the 5 watersheds analyzed for effects on anadromous fish have been determined to be properly functioning, and will act as buffers to any sediment generated by vehicle travel on roads located within known or historically occupied habitat for the 4 fish species. However, removing vehicle use from 46 miles of unauthorized routes in riparian reserves will eliminate soil displacement on those routes and at 11 stream crossings. Sediment delivery from these routes to stream channels should decrease. No new routes or stream crossings would be created. Embeddedness will not increase, and may decrease over time as sediment input declines, which would be a long term benefit to fish and fish habitat.

Stream temperature

Damage to riparian vegetation from unmanaged off-road travel on roads located within riparian reserves would be reduced on 46 miles (92 acres) of unauthorized routes. Most of these routes are not immediately adjacent to streams, so that revegetation will have minimal effects on stream shading. There will be a neutral effect to stream temperature.

Barriers

No new barriers to fish migration would be created since no new unauthorized routes would be created.

Direct and indirect effects of adding facilities to the NFTS

Direct effects would involve crushing of fish or eggs at stream crossings accessible by vehicles, although most fish can evade tires at crossings. This alternative proposes two crossings in Middle Fork Humbug Creek, which are upstream of coho salmon habitat but within habitat for steelhead and rainbow trout. No spawning habitat is present at either crossing so no direct effects to anadromous fish or resident rainbow trout redds or eggs are expected. Effects are considered to be insignificant for fish. These sites have been evaluated by fisheries biologists for both the Forest Service and National Marine Fisheries Service, and effects are addressed in the BA/BE.

Sediment

Effects to sediment are expected to be insignificant in the short term and beneficial in the long term for the following reasons:

- The three perennial stream crossings (two in the Humbug drainage and one in Long John Creek) would be rocked to reduce the potential for sedimentation.
- Most routes within riparian reserves are separated from the stream channel by riparian vegetation. Riparian reserves in 4 of the 5 watersheds analyzed for effects on anadromous fish have been determined to be properly functioning, and will act as buffers to any sediment generated by vehicle travel on roads located within known or historically occupied habitat the 4 fish species.
- The contribution to sediment loading from these routes is considered insignificant, and is immeasurable at the 7th field watershed scale.
- Routes within riparian reserves that are added to the NFTS will receive maintenance as needed to ensure that they do not contribute sediment to adjacent streams.

Field review of the Humbug area has resulted in site-specific mitigations that will be completed prior to the area being open for public use. About 14 miles of routes in Humbug would be improved, and mitigations include construction of drainage features, surface blading,

and signing to encourage riders to remain on the established trails. These measures will reduce the amount of sedimentation from these routes over the long term. Mitigation measures are displayed in the Soils and Recreation sections of this chapter.

Fifty-three acres of open riding area (48 acres at Juniper Flat and 5 acres in the Humbug open riding area), in which cross-country motorized travel would not be prohibited, would be available for use. The watersheds on which Juniper Flat is situated do not have perennial water and do not drain into fish-bearing streams; there will be no impact on fish or fish habitat from this open riding area. The Humbug open riding area is adjacent to an NFTS road, and consists of hills that drain into a large flat that lies below the level of the road. There is no riparian vegetation within the riding area. Although this area is within a riparian reserve, it is not hydrologically connected to a stream. Continued use of this area by OHVs should not affect anadromous fish, resident rainbow trout or their habitat.

Routes existing/proposed within known or historically occupied habitat

Motorized use would continue on 3.6 miles of existing routes within SONCC habitat, 1.3 miles in UKT habitat, 2.3 miles in steelhead habitat, and 9.2 miles in rainbow trout habitat on the west side of the KNF. The effects on fish habitat of continued motorized use of these routes are considered to be insignificant. The routes are distributed over numerous watersheds; their cumulative contribution to sediment loading would be immeasurable at the 7th field watershed scale.

Riparian Reserves/Stream Temperature

This alternative designates 21 miles of roads (42 acres) within riparian reserves, most of which are not immediately adjacent to the stream channel. They are primarily short, rough-graded spurs from which vegetation has already been removed. Regrowth of vegetation on these routes would not provide a significant contribution to stream shading, so there will be a neutral effect to stream temperature and an insignificant effect to riparian reserves.

Barriers

No barriers to fish migration would be created. The existing stream crossing in the Middle Fork Humbug Creek drainage is not a barrier to fish migration, and the rocking work will be done so that fish passage is not hindered.

Cumulative effects

Cumulative effects are the effects of prohibiting cross-country travel on 1.2 million acres and addition of unauthorized routes to the NFTS, added to the effects from the ongoing and

foreseeable road-related actions (Appendix B). There will be substantial benefits from removing vehicle use from 1.2 million acres of KNF lands.

This alternative would add 69 miles of unauthorized route as open road and motorized trail to the KNF. Ongoing and foreseeable road-related actions would add 13 miles of ML 1 roads and 26 miles of ML 2 roads to the NFTS, and remove 50 miles of road from the NFTS (48 miles through decommissioning and 2 miles through conversion to a hiking trail). ML 1 roads will be closed to motorized vehicle traffic and, thus, should not produce effects on fish habitat. These activities would result in a net increase in 42 miles of open road and motorized trail forest-wide. However, most of the road construction will occur on the east side of the Forest. On the west side of the Forest, where anadromous habitat occurs, this alternative added to ongoing and foreseeable projects results in the addition of about 42 miles of ML2 road and motorized trail to the NFTS, and removal of 50 miles of road from the NFTS, a net decrease of about 8 miles of ML 2 road or motorized trail. Effects will be dispersed across 88 watersheds on the west side and 44 on the east side; effects will not be measurable at the watershed scale.

There will be a substantial benefit from removing vehicle use from 1.2 million acres of lands.

Alternative 6

Direct and indirect effects of prohibition of cross-country motor vehicle travel

No direct effects to the young life stages of the four fish species will occur from vehicle movement through stream channels. No new unauthorized routes would be created, which will eliminate the potential for direct effects occurring in the future.

Road density

Unmanaged off-road travel would be eliminated from 1.2 million acres, reducing open road density in all one hundred and eighty-eight 7th field watersheds in which unauthorized routes exist, including the 5 watersheds analyzed for effects on anadromous fish (Table F-4).

Riparian Reserves

In both the short term and long term, soil disturbance in riparian reserves from unmanaged off-road vehicle use would be eliminated from 49 miles of unauthorized routes where cross-country motor travel would be prohibited. In the long term, soils on 98 acres in riparian reserves will slowly decompact, and the routes will revegetate, resulting in beneficial effects to riparian conditions.

Routes existing/proposed within known or historically occupied habitat

Motorized use would be removed from 4.2 miles of unauthorized routes within SONCC habitat, 1.3 miles of unauthorized routes within UKT habitat, 2.8 miles of unauthorized routes within KMP steelhead habitat, and 10 miles of unauthorized routes within rainbow trout habitat. There would be no new unauthorized routes created, and the unauthorized routes within anadromous fish and rainbow trout habitat should slowly recover in the long term through passive restoration once motorized vehicle use ceases.

Sediment

Most routes within riparian reserves are separated from the stream channel by riparian vegetation. Riparian reserves in 4 of the 5 watersheds analyzed for effects on anadromous fish have been determined to be properly functioning, and will act as buffers to any sediment generated by vehicle travel on roads located within known or historically occupied habitat for the 4 fish species. However, removing vehicle use from 49 miles of unauthorized routes in riparian reserves will eliminate soil displacement on those routes and at 11 stream crossings. Sediment delivery from these routes to stream channels should decrease. No new routes or stream crossings would be created. Embeddedness will not increase, and may decrease over time as sediment input declines, which would be a long term benefit to fish and fish habitat.

Stream temperature

Damage to riparian vegetation from unmanaged off-road travel on roads located within riparian reserves would be reduced on 49 miles (98 acres) of unauthorized routes. Most of these routes are not immediately adjacent to streams, so that revegetation will have minimal effects on stream shading. There will be a neutral effect to stream temperature.

Barriers

No new barriers to fish migration would be created since no new unauthorized routes would be created.

Direct and indirect effects of adding facilities to the NFTS

Direct effects would involve crushing of fish or eggs at stream crossings accessible by vehicles, although most fish can evade tires at crossings. This alternative proposes two crossings in Middle Fork Humbug Creek, which are upstream of coho salmon habitat but within habitat for steelhead and rainbow trout. No spawning habitat is present at either crossing so no direct effects to anadromous fish or resident rainbow trout redds or eggs are expected. These sites have been evaluated by fisheries biologists for both the Forest Service and National Marine Fisheries Service, and effects are addressed in the BA/BE. Effects are considered to be insignificant for fish.

Sediment

Effects to sediment are expected to be insignificant in the short term and beneficial in the long term for the following reasons:

- The three perennial stream crossings (two in the Humbug drainage and one in Long John Creek) would be rocked to reduce the potential for sedimentation.
- Most routes within riparian reserves are separated from the stream channel by riparian vegetation. Riparian reserves in 4 of the 5 watersheds analyzed for effects on anadromous fish have been determined to be properly functioning, and will act as buffers to any sediment generated by vehicle travel on roads located within known or historically occupied habitat the 4 fish species.
- The contribution to sediment loading from these routes is considered insignificant, and is immeasurable at the 7th field watershed scale.
- Routes within riparian reserves that are added to the NFTS will receive maintenance as needed to ensure that they do not contribute sediment to adjacent streams.

Field review of the Humbug area has resulted in site-specific mitigations that will be completed prior to the area being open for public use. About 13 miles of routes in Humbug would be improved, and mitigations include construction of drainage features, surface blading, and signing to encourage riders to remain on the established trails. These measures will reduce the amount of sedimentation from these routes over the long term. Mitigation measures are displayed in the Soils and Recreation sections of this chapter.

Fifty-three acres of open riding area (48 at Juniper Flat and 5 acres in the Humbug open riding area), in which cross-country motorized travel would not be prohibited, would be available for use. The watersheds on which Juniper Flat is situated do not have perennial water and do not drain into fish-bearing streams; there will be no impact on fish or fish habitat from this open riding area. The Humbug open riding area is adjacent to an NFTS road, and consists of hills that drain into a large flat that lies below the level of the road. There is no riparian vegetation within the riding area. Although this area is within a riparian reserve, it is not hydrologically connected to a stream. Continued use of this area by OHVs should not affect anadromous fish, resident rainbow trout or their habitat.

Routes existing/proposed within known or historically occupied habitat

Motorized use would continue on 10.4 miles of existing routes within SONCC habitat, 9.1 miles in UKT habitat, 11.9 miles in steelhead habitat, and 13.4 miles in rainbow trout habitat. Effects on fish habitat of continued motorized use of these routes are considered to be insignificant. The

routes are distributed over numerous watersheds; their cumulative contribution to sediment loading would be immeasurable at the 7th field watershed scale.

Riparian Reserves/Stream Temperature

This alternative designates 18 miles of roads (36 acres) within riparian reserves, most of which are not immediately adjacent to the stream channel. They are primarily short, rough-graded spurs from which vegetation has already been removed. Regrowth of vegetation on these routes would not provide a significant contribution to stream shading, so there will be a neutral effect to stream temperature and an insignificant effect to riparian reserves.

Barriers

No barriers to fish migration would be created. The existing stream crossing in the Middle Fork Humbug Creek drainage is not a barrier to fish migration, and the rocking work will be done so that fish passage is not hindered.

Cumulative effects

Cumulative effects are the effects of prohibiting cross-country travel on 1.2 million acres and addition of unauthorized routes to the NFTS, added to the effects from the ongoing and foreseeable road-related actions (Appendix B). There will be substantial benefits from removing vehicle use from 1.2 million acres of the KNF.

This project would add 59 miles of routes to the NFTS; ongoing and foreseeable road-related actions would add 13 miles of ML 1 roads and 26 miles of ML 2 roads to the NFTS, and remove 50 miles of road (48 miles through decommissioning and 2 miles through conversion to a hiking trail). ML 1 roads will be closed to motorized vehicle traffic and, thus, should not produce effects on fish habitat. These activities would result in a net increase of about 35 miles of open road forest-wide. However, most of the increase will occur on the east side of the Forest. On the west side of the Forest, this alternative added to ongoing and foreseeable projects results in the addition of about 37 miles of ML 2 road to the NFTS, and removal of 50 miles of road from the NFTS, a net decrease of about 13 miles of ML 2 road or motorized trail. Effects will be dispersed across 69 watersheds on the west side and 36 on the east side; effects will not be measurable at the watershed scale.

Alternative 7

Direct and indirect effects of prohibition of cross-country motor vehicle travel

No direct effects to the young life stages of the four fish species will occur from vehicle movement through stream channels. No new unauthorized routes would be created, which will eliminate the potential for direct effects occurring in the future.

Road density

Unmanaged off-road travel would be eliminated from 1.2 million acres, reducing open road density in all one hundred and eighty-eight 7th field watersheds in which unauthorized routes exist, including the 5 watersheds analyzed for effects on anadromous fish (Table F-4).

Riparian Reserves

In both the short term and long term, soil disturbance in riparian reserves from unmanaged off-road vehicle use would be eliminated from 47 miles of unauthorized routes where cross-country motor travel would be prohibited. In the long term, soils on 94 acres in riparian reserves will slowly decompact, and the routes will revegetate, resulting in beneficial effects to riparian conditions.

Routes existing/proposed within known or historically occupied habitat

Motorized use would be removed from 3.6 miles of unauthorized routes within SONCC habitat, 1.3 miles of unauthorized routes within UKT habitat, 2.3 miles of unauthorized routes within KMP steelhead habitat, and 9.2 miles of unauthorized routes within rainbow trout habitat. There would be no new unauthorized routes created, and the unauthorized routes within anadromous fish and rainbow trout habitat should slowly recover in the long term through passive restoration once motorized vehicle use ceases.

Sediment

Most routes within riparian reserves are separated from the stream channel by riparian vegetation. Riparian reserves in 4 of the 5 watersheds analyzed for effects on anadromous fish have been determined to be properly functioning, and will act as buffers to any sediment generated by vehicle travel on roads located within known or historically occupied habitat for the 4 fish species. However, removing vehicle use from 47 miles of unauthorized routes in riparian reserves will eliminate soil displacement on those routes and at 13 stream crossings. Sediment delivery from these routes to stream channels should decrease. No new routes or stream crossings would be created. Embeddedness will not increase, and may decrease over time as sediment input declines, which would be a long term benefit to fish and fish habitat.

Stream temperature

Damage to riparian vegetation from unmanaged off-road travel on roads located within riparian reserves would be reduced on 47 miles (94 acres) of unauthorized routes. Most of these routes are not immediately adjacent to streams, so that revegetation will have minimal effects on stream shading. There will be a neutral effect to stream temperature.

Barriers

No new barriers to fish migration would be created since no new unauthorized routes would be created.

Direct and indirect effects of adding facilities to the NFTS

Direct effects would involve crushing of fish or eggs at stream crossings accessible by vehicles, although most fish can evade tires at crossings. This alternative proposes one stream crossing in Middle Fork Humbug Creek, upstream of coho salmon habitat but within habitat for steelhead and rainbow trout. No spawning habitat is present at this crossing so no direct effects to anadromous fish or resident rainbow trout redds or eggs are expected. This site has been evaluated by fisheries biologists for both the Forest Service and National Marine Fisheries Service, and effects are addressed in the BA/BE. Effects are considered to be insignificant for fish.

Sediment

Effects to sediment are expected to be insignificant in the short term and beneficial in the long term for the following reasons:

- One perennial stream crossing in the Humbug drainage would be rocked to reduce the potential for sedimentation.
- Most routes within riparian reserves are separated from the stream channel by riparian vegetation. Riparian reserves in 4 of the 5 watersheds analyzed for effects on anadromous fish have been determined to be properly functioning, and will act as buffers to any sediment generated by vehicle travel on roads located within known or historically occupied habitat the 4 fish species.
- The contribution to sediment loading from these routes is considered insignificant, and is immeasurable at the 7th field watershed scale.
- Routes within riparian reserves that are added to the NFTS will receive maintenance as needed to ensure that they do not contribute sediment to adjacent streams.

Field review of the Humbug area has resulted in site-specific mitigations that will be completed prior to the area being open for public use. About 12.5 miles of routes in Humbug would be improved; mitigations include construction of drainage features, surface blading, and signing to encourage riders to remain on the established trails. These measures will reduce the amount of sedimentation from these routes over the long term. Mitigation measures are displayed in the Soils and Recreation sections of this chapter.

Fifty-three acres of open riding area (48 at Juniper Flat and 5 acres in the Humbug open riding area), in which cross-country motorized travel would not be prohibited, would be available

for use. The watersheds on which Juniper Flat is situated do not have perennial water and do not drain into fish-bearing streams; there will be no impact on fish or fish habitat from this open riding area. The Humbug open riding area is adjacent to an NFTS road, and consists of hills that drain into a large flat that lies below the level of the road. There is no riparian vegetation within the riding area. Although this area is within a riparian reserve, it is not hydrologically connected to a stream. Continued use of this area by OHVs should not affect anadromous fish, resident rainbow trout or their habitat.

Routes existing/proposed within known or historically occupied habitat

Motorized use would continue on 10.4 miles of existing routes within SONCC habitat, 9.1 miles in UKT habitat, 11.9 miles in steelhead habitat, and 13.4 miles in rainbow trout habitat on the west side of the KNF. Effects on fish habitat of continued motorized use of these routes are considered to be insignificant. The routes are distributed over numerous watersheds; their cumulative contribution to sediment loading would be immeasurable at the 7th field watershed scale.

Riparian Reserves/Stream Temperature

This alternative designates 20 miles of roads (40 acres) within riparian reserves, most of which are not immediately adjacent to the stream channel. They are primarily short, rough-graded spurs from which vegetation has already been removed. Regrowth of vegetation on these routes would not provide a significant contribution to stream shading, so there will be a neutral effect to stream temperature and an insignificant effect to riparian reserves.

Barriers

No barriers to fish migration would be created. The existing stream crossing in the Middle Fork Humbug Creek drainage is not a barrier to fish migration, and the rocking work will be done so that fish passage is not hindered.

Cumulative effects

Cumulative effects are the effects of prohibiting cross-country travel on 1.2 million acres and addition of unauthorized routes to the NFTS, added to the effects from the ongoing and foreseeable road-related actions (Appendix B). There will be substantial benefits from removing vehicle use from 1.2 million acres of the KNF.

This project would add 74 miles of routes to the NFTS; ongoing and foreseeable road-related actions would add 13 miles of ML 1 roads and 26 miles of ML 2 roads and motorized trails to the NFTS, and remove 50 miles of road (48 miles through decommissioning and 2 miles through conversion to a hiking trail). ML 1 roads will be closed to motorized vehicle traffic and, thus,

should not produce effects on fish habitat. These activities would result in a net increase of about 50 miles of open road forest-wide. However, most of the increase will occur on the east side of the Forest. On the west side of the Forest, this alternative added to ongoing and foreseeable projects results in the addition of about 37 miles of ML2 road to the NFTS, and removal of 50 miles of road, a net decrease of about 13 miles. Effects will be dispersed across 71 watersheds on the west side and 36 on the east side; effects will not be measurable at the watershed scale.

Summary of Effects Across All Alternatives

Of all proposed actions, the prohibition of cross-country travel in all action alternatives has the greatest beneficial effect on fish. While the alternatives differ from each other in the level of effects on fisheries, for all action alternatives it is unlikely that the effects of addition of some unauthorized routes to the NFTS will be measurable or discernable from the multiple natural and human-induced changes that occur over the landscape on the KNF. Effects from floods, natural landslides, wildfires, and myriad human activities (flow management, residential development, agricultural runoff, vegetation management on federal and private lands) continue to affect fish habitat quality and population levels. Many watersheds analyzed have more than 50% private land, and the ability of the KNF to effect change at the watershed scale is limited. Effects of vehicle-generated sediment from unauthorized routes into the main stem of the Klamath River are not measurable and insignificant compared with that generated by the current road system, management activities, flooding, and wildfire.

The action alternatives that include mitigations in the Humbug drainage (Alternatives 2, 4, 5, 6, and 7) all provide an opportunity to improve embeddedness of Upper Humbug Creek, Middle Fork Humbug Creek, and Lower Humbug Creek by reducing potential sedimentation in streams. Alternatives 2, 5, 6, and 7 would also improve a stream crossing on Middle Fork Humbug Creek (on route 7H002.2). This stream approach is on relatively level ground and the road length draining into the stream channel crossing is short. In Alternative 7 only this one unauthorized route crossing Middle Fork Humbug Creek is proposed for addition to the NFTS; in Alternatives 2, 4, 5, and 6 there is another unauthorized route being proposed for addition to the NFTS that crosses this stream and includes a steeper approach.

Table 3 compares the alternatives by indicator.

Table F-3. Fisheries indicators values for all action alternatives

	Alternatives						
Indicator	Alt 1	Alt 2	Alt 3	Alt 4	Alt 5	Alt 6	Alt 7
Miles of unauthorized routes/routes proposed for addition to the NFTS within or adjacent to Riparian Reserves	67	23	0	0.4	21	18	20
Acres of Riparian Reserves affected by unauthorized routes/routes proposed for addition to the NFTS	134	46	0	1	42	36	40

Miles of routes proposed for addition to the NFTS within known or historically occupied TES and MIS habitats:							
SONCC	14.6	7.2	0	0	11.0	10.4	10.4
UKT	10.4	6.4	0	0	9.1	9.1	9.1
Steelhead	14.7	8.8	0	0.2	12.4	11.9	11.9
Rainbow trout (west side)	23.4	11.7	0	0.2	14.2	13.4	13.4
Rainbow trout (east side)	14.7	4.3	0	0.0	4.4	3.8	4.4
Sediment delivery - embeddedness	No change	Improve	Improve	Improve	Improve	Improve	Improve
Stream Temperature	No change	No change	No change	No change	No change	No change	No change
Migration Barriers	New barriers could be created	No new barriers	No new barriers	No new barriers	No new barriers	No new barriers	No new barriers

Table F-4. Route density for watersheds with proposed additions to NFTS that are occupied by the three TES anadromous fish species and the MIS fish species

7th Field Watershed	Current Route Density (Alt. 1)	Route Density (miles/mile^2)*					
		2	3	4	5	6	7
Little Humbug Creek	3.52	2.51	2.50	2.59	2.59	2.59	2.59
Lower Humbug Creek	2.59	1.99	1.99	2.02	2.02	2.02	2.02
M.F. Humbug Creek	4.59	3.12	2.21	2.42	2.83	2.83	2.83
Upper Humbug Creek	5.58	3.63	2.65	2.65	4.02	3.81	3.90
Buckhorn Creek	4.68	4.43	4.34	4.34	4.38	4.37	4.38

***Route densities include state, county, private, NFTS and open unauthorized routes**

Consultation

The SONCC Coho Salmon was listed as Threatened on May 6, 1997 (62 FR 24588). This status was reaffirmed in a Final Rule published on June 28, 2005 (70 FR 37160). In accordance with the Endangered Species Act of 1973, as amended, a Biological Assessment (BA) was prepared for the Klamath National Forest Motorized Travel Management Project. The BA/BE is incorporated by reference and may be found in the project files.

Determinations for Special Status Species

The draft BA/BE for Fish sent to National Marine Fisheries Service on January 11, 2010, concluded that the implementation of any of the action alternatives **may affect, but is not likely to adversely affect** SONCC coho salmon. The BA/BE also concluded that there would not be

adverse effects to UKT Chinook salmon and KMP steelhead trout, and the project is not likely to lead toward a loss in population viability.

The "**not likely to trend towards federal listing or loss of viability**" determination is made because: (1) the scope of adding the proposed unauthorized routes is limited in area when compared to a fish species' distribution; (2) the species' presence in site-specific areas where routes would be added is highly unlikely; (3) there are no direct effects to habitat from the action; (4) the prohibition of cross-country vehicle travel results in beneficial effect for all species; (5) cumulative effects from other projects are beneficial to fish; and (6) there is opportunity for improvement to fish habitat under all action alternatives (compared to no action) given the likelihood that miles of unauthorized routes would recover and revegetate over the long term. Any effects from continuation of travel on existing routes would be offset by the benefits of prohibiting cross-country motorized travel on 1.2 million acres of lands, over 41,150 acres of which are in analyzed watersheds that support fish.

A Biological Assessment for terrestrial wildlife was completed for this project. That BA documented that the Project Design Criteria were addressed for the Lost River sucker and short nose sucker, and included a No Effect determination for these two species.

There would be **no effect** to any fish species or habitat under Alternatives 3 or 4.

Table F-5. Determination for TES fish species under Alternatives 2, 4, 5, 6, & 7

Common Name	Scientific Name Status	Status	Determination
Upper Klamath-Trinity Rivers (UKT) Chinook salmon	*Oncorhynchus tshawytscha*	Forest Sensitive	May affect individuals or habitat, but is not likely to trend towards federal listing or a loss of viability to the population
Klamath Mountains Province(KMP) Steelhead trout	*Oncorhynchus mykiss*	Forest Sensitive	May affect individuals or habitat, but is not likely to trend towards federal listing or a loss of viability to the population
Southern Oregon/Northern California Coasts (SONCC) Coho Salmon	*Oncorhynchus kisutch*	Federally Threatened	May affect individuals or habitat, but is not likely to adversely affect
Short Nose Sucker	*Chasmistes brevirostris*	Federally Endangered	No effect
Lost River Sucker	*Catostomus luxatus*	Federally Endangered	No effect

Beneficial Uses

The determinations listed above indicate that there will be no significant impacts to the beneficial use of fish habitat under any of the action alternatives. The May Affect determination was made based on a potential for effects on individuals. Implementation of any of the action alternatives will comply with the Clean Water Act (see Hydrology section).

Compliance with the LRMP and Other Direction

All alternatives comply with the Endangered Species Act. None of the alternatives, if implemented, would be likely to jeopardize the continued existence of a threatened or endangered species, or result in the destruction or adverse modification of habitat of such species that is determined to be critical.

All alternatives comply with standards and guidelines in the KNF LRMP.

Terrestrial Wildlife

Introduction

Management of terrestrial wildlife and habitat, and maintenance of a diversity of animal communities, is an important part of the mission of the Forest Service. Management activities on National Forest System (NFS) Lands are planned and implemented so that they do not jeopardize the continued existence of threatened or endangered species, or lead to a trend toward listing or loss of viability of Forest Service Sensitive species. Management decisions related to motor vehicle travel can affect terrestrial species by increasing human-caused mortality, changing behavior due to disturbance, and modifying habitat (Gaines et al. 2003, Trombulak and Frissell 2000). It is Forest Service policy to minimize damage to vegetation, minimize harassment to wildlife, and minimize significant disruption of wildlife habitat while providing for motor vehicle use on NFS lands. Therefore, management decisions related to motor vehicle travel on NFS lands must consider effects to wildlife and their habitat.

Analysis Framework: Statute, Regulation, LRMP, and Other Direction

Direction relevant to the proposed action as it affects terrestrial wildlife includes:

The Endangered Species Act of 1973 (ESA) states that each Federal agency shall, in consultation with and with the assistance of the Secretary insure that any action authorized, funded, or carried out by such agency is not likely to jeopardize the continued existence of any threatened or endangered (TE) species or result in the destruction or adverse modification of habitat of such species. Section 7 of the ESA, as amended, requires the responsible federal agency to consult the US Fish and Wildlife Service concerning threatened or endangered wildlife species under their jurisdiction. In October 2006, Region 5 developed route designation project design criteria for threatened and endangered species and critical habitat to achieve “no effect” or “may affect not likely to adversely affect” determinations on a programmatic level. The Klamath National Forest was included in the programmatic consultation completed with the U.S. Fish and Wildlife Service on December 27, 2006, whereby the Service concurred that by following the criteria described, route designation activities would have no adverse affects. Only one terrestrial wildlife species (bald eagle) was included for the KNF in the project design criteria.

The National Forest Management Act (NFMA) provides direction on selection of management indicator species (MIS), which represent larger groups of species filling similar ecological niches or occupying similar habitats. These species and their habitats have been aggregated and described in the Klamath Land and Resource Management Plan (LRMP). During

the NEPA process, the project-level MIS effects to these aggregations are analyzed and disclosed. The intent is that the Forest will manage for the needs of representative species or for an assemblage of species using the same habitat.

Forest Service Manual 2670 provides direction regarding Forest Service sensitive species, which have been identified by the Regional Forester as species for which population viability is a concern. The Forest Service develops and implements management practices to ensure that rare plants and animals do not become threatened or endangered and ensure their continued viability on National Forests.

Forest Service Manual 2353.03(2) provides direction to minimize damage to vegetation, minimize harassment to wildlife, and minimize significant disruption of wildlife habitat while providing for motor vehicle use on National Forest System lands.

The Klamath National Forest Land and Resource Management Plan identifies the following standards and guidelines applicable to motor vehicle travel management and terrestrial wildlife, which are applied to all alternatives and will be considered during the analysis process.

8-37 Restrict activities within 1/4-mile of active Swainson's hawk nests during the nesting season (April 15 to August 15).

8-44 Manage "open" road densities to reduce the level of human interaction with bears during critical times of the year.

8-50 Close roads when necessary to limit activities that inhibit deer use of quality foraging, fawning/rearing or wintering areas. Maintain or establish roadside screening along open roads in areas important for migration, fawning/rearing or concentrated seasonal use.

8-54 When appropriate, close roads to limit activities that inhibit elk use of quality foraging, fawning/rearing or wintering areas.

Bald Eagle

MA5-43	Establish nest/roost protection areas and primary protection areas around eagle roost and nest site. Management activities within this zone shall be directed toward providing for the biological and physical integrity of the nest/roost site and to minimize human disturbance during periods of use.
MA5-49	Direct dispersed recreational activities away from nesting and roosting habitat. Managed Wildlife Area (late-successional habitat)
MA 6-8	Restrict open road densities to 1/2 to 2 miles of open road per square mile to minimize human disturbance.
MA 7-7	Restrict OHV use. Winter Range (Mule deer and pronghorn)
MA14-9	Access may be limited in order to affect the quality of the habitat. Forage (Mule deer)
MA16-9	Access may be limited in order to affect the quality of the habitat.

The **Klamath National Forest Forest-Wide Late-Successional Reserve Assessment** identifies the management strategy for Late-Successional Reserves (LSRs) on the KNF, including criteria for developing appropriate treatments.

The **Klamath National Forest Elk Management Strategy** (Allison et al. 2007), developed in cooperation with the Rocky Mountain Elk Foundation, California Department of Fish and Game, and the Six Rivers National Forest, identifies the objectives and priorities for managing elk on the KNF.

Effects Analysis Methodology

Each alternative contains a subset of the identified unauthorized roads. The roads included for analysis were determined to be those with the fewest resource issues or conflicts for a variety of resources. A biologist screened all the public-identified routes prior to their inclusion in an alternative. Routes where resource concerns could not be resolved efficiently and cost-effectively, even with application of design standards, were eliminated from further consideration in this project. For additional information on alternative development, see Chapter 2.

Literature describing the effects of motorized roads and trails on wildlife has grouped or categorized species in various ways to describe effects (Knight and Gutzwiller, ed. 1995, in Gaines et al. 2003, Wisdom et al 2000). Gaines et al. (2003) categorized species into the following groups or assemblages based upon a combination of their biology and interactions with road- and motorized trail-associated factors: (1) late-successional forest (interior forest) associated species; (2) wide-ranging carnivores; (3) ungulates; (4) riparian/meadow-dependent; (5) grassland/shrub-steppe, (6) snag/cavity dependent species; (7) and hardwood/hardwood-mixed conifer dependent. These associations reflect the majority of habitat types on the KNF and

are used for this project. Focal species were selected that represent the range of habitats within the habitat associations (Table TW-1). With the exception of federally threatened and Forest Service sensitive species, potential effects to the focal species of each association (not all individual species) will be addressed in this document.

Table TW-1. Forest terrestrial wildlife TES, MIS, and habitat associations

Grouping	Species	Status
Late-Successional	Northern Spotted Owl	T
	Marbled Murrelet	T
	Northern Goshawk	S
	Great Grey Owl	S
	Pacific Fisher	S/C
	American Marten	S
	California Wolverine	S
	Tehama Chaparral Snail	S
	Blue-Grey Tail Dropper	S
Wide-Ranging Carnivores	Sierra Nevada Red Fox	S
	Black Bear	Emph
Ungulates	Black Tailed Deer	Emph
	Roosevelt Elk	Emph
Riparian Dependent (This group combines the Marsh/Lake/Pond and River/Stream and Meadow/Riparian Associations)	Bald Eagle	S
	Willow Flycatcher	S
	Western Pond Turtle	S
	Foothill Yellow-Legged Frog	S
	Greater Sandhill Crane	S
	Cascade Frog	S
	Southern Torrent Salamander	S
	American Dipper	MIS
	Northern Red-Legged Frog	MIS
	Tailed Frog	MIS
	Northern Water Shrew	MIS
	Long-Tailed Vole	MIS
Grassland/Shrub-Steppe	Pronghorn	MIS
	Swainson's Hawk	S
	Burrowing Owl	MIS
Cavity-Dependent	Black-backed Woodpecker	MIS
	Downy Woodpecker	MIS
	Hairy Woodpecker	MIS
	Red Breasted Sapsucker	MIS
	Vaux's Swift	MIS
	Pallid Bat	S
	White-headed Woodpecker	MIS
	Pileated Woodpecker	MIS
Hardwood / Hardwood-Mixed Conifer	Acorn Woodpecker	MIS
	Western Grey Squirrel	MIS

Key: T – Federally Threatened E – Federally Endangered S – FS Sensitive
MIS – Management Indicator Species C-Candidate for Federal Listing Emph – Forest Emphasis

The alternatives contain three discrete actions:

(1) The prohibition of cross-country motor vehicle travel

(2) The addition of unauthorized roads, trails, and open riding areas to the National Forest Transportation System (NFTS); and

(3) Changes to the existing NFTS that include changing the vehicle class, prohibiting non-highway-legal vehicle use, or opening previously-closed road segments.

The first two actions were analyzed for each alternative for the focal species in the identified habitat associations (see Methodology by Action for reasons that changes to the NFTS were not addressed in detail). Effects to individual species and/or their habitats vary depending on time of year, duration, and intensity of use.

Relying on a review of available literature, Gaines et al. (2003) summarized road and trail-associated factors and their effects upon groups of wildlife species. Primary effects from this project are considered to be habitat-based (loss or destruction of habitat) or physiological in nature (displacement, avoidance, effects on reproductive activities). Both types of effects are addressed in this analysis where applicable.

Analysis Specific to Late-Successional Habitat Species Group

The species in this group all share an affinity for late-successional forests. For this analysis, the vegetation description that characterizes Northern Spotted Owl (NSO) habitat is used as a surrogate for Pacific fisher, American marten, goshawks, and marbled murrelet. Murrelet habitat is only considered within Zone 2, as defined by USFWS. The subset of suitable NSO habitat occurring in elevations greater than 4,500 feet is considered to be marten habitat.

Current information regarding disturbance from vehicles (local decibel levels, type of noise, and especially duration of disturbance) is unknown. Many of the routes analyzed are in close proximity to roads that are part of the National Forest Transportation System (NFTS), so that vehicle noise will continue to occur in many areas whether or not unauthorized routes are closed. Given the inability to precisely determine locations, timing, and the duration of vehicle traffic associated with this action, this analysis takes a conservative approach and assumes that animals in suitable habitat within 0.25 mile (approximately 400 m) of unauthorized routes could be affected by vehicle noise. In Endangered Species Act consultation with the USFWS, the agencies agreed that the 0.25-mile “disturbance buffer” reflects the area that would be exposed to vehicular noise. Effects to late-successional species are evaluated by the amount of suitable habitat currently open to off-road vehicle travel.

Analysis Specific to Ungulate Group

For this project, ungulates are elk and deer (pronghorn are analyzed in the grassland/shrub steppe group). The effects of roads on elk habitat suitability have been well documented (Rowland et. al. 2004). Current modeling approaches can predict habitat effectiveness (Wisdom et al. 1986 in Allison et al. 2007), habitat capability (Benkobi et al. 2004), and habitat suitability (Juntti and Rumble 2006, in Allison et al. 2007) using a number of habitat inputs. To quantify potential impacts, buffered areas can be applied to roads and trails based on use level and type of habitat. The Klamath National Forest Elk Management Strategy (Allison et al. 2007) was developed in cooperation with the Rocky Mountain Elk Foundation, California Department of Fish and Game, and the Six Rivers National Forest. Suitable elk habitat was modeled for Klamath elk herds using frameworks from existing models that involve the interactions of road densities along with amount and spacing of cover and forage areas. The Klamath model also evaluated juxtaposition of habitat components in relation to each other as well as road density and road use. Buffer distances (a proxy for potential disturbance) are consistent with the methodology of evaluating habitat suitability, but are not used for this project. Unauthorized routes added to the NFTS would be managed as Maintenance Level 2 (ML 2) roads or motorized trails (designated as "primitive" in the Management Strategy). Such low use "primitive" roads were considered to have no effect on elk use of adjacent forage and/or cover habitats. Instead, road densities are used as a proxy for disturbance. The elk habitat capability model does not suggest any specific road density, but habitat effectiveness is inversely proportional to open road density.

Road densities are an important variable in habitat capability models. For black-tailed deer, the LRMP describes desired road densities to achieve certain levels of habitat capability. Less than 1.5 miles of road per square mile is considered to provide high capability, and 1.5– 3 miles of road per square mile is considered to provide moderate capability. Anything over 3 miles of road per square mile is low or marginal capability. Primary (open) road densities per square mile are compared against habitat capability models (KNF LRMP 1995). Motorized routes may not be distributed evenly; therefore, the cumulative route density was assessed by 7th field watershed where appropriate for the ungulate group (expressed as miles of open routes or roads per square mile). As ungulate numbers and health are tied to conditions on identified seasonal use ranges, effects of this project on those ranges were analyzed. This analysis looked at 7th field watersheds with open road densities exceeding 3 miles per square mile within deer and elk seasonal ranges.

Analysis Specific to Riparian Group

Approximately 2,500 miles of perennial and intermittent streams bounded by riparian reserves occur on the KNF. The riparian reserves contain approximately 9,270 acres of riparian habitats. There is a difference in acres and effects between riparian habitats and riparian reserves. Riparian reserves are a land allocation in the LRMP, with fixed widths (150-340') along a stream channel. They may or may not contain riparian vegetation (riparian reserves along ephemeral or

intermittent stream channels often do not). Where possible, this analysis concentrated on acres of riparian habitats affected as a more precise measure of effects; data are presented both by miles of routes within riparian habitats, and by miles of routes within riparian reserves. Where a species is specifically associated with stream habitat (tailed frog, long-tailed vole), miles of routes (and their equivalent acres) in riparian reserves is used as a proxy to denote effects. Effects based on miles of routes within riparian reserves may be over-estimated due to variability in occurrence of riparian vegetation.

It is difficult for an analysis at this scale to precisely quantify effects to suitable habitat for these species because of the microsite conditions found within these areas. GIS habitat query results may under-represent actual conditions because remote sensing and the vegetation classification models may not have captured the attributes of the small-scale riparian habitats potentially used by this focal group, or they may classify polygons based on overstory cover rather than the riparian cover (Creasy, personal communication 2009; Torpin, personal communication 2009).

Riparian-associated species primarily use the linear riparian zones, but some species such as western pond turtles, red-legged frogs, and willow flycatchers utilize upland areas as well for feeding, breeding, or dispersing. Most of this area is within the boundaries of identified riparian reserves.

Assumptions Specific to the Terrestrial Wildlife Analysis

- No surveys were conducted specifically for this project. Past surveys and data were used to determine breeding locations and occupancy of habitat. Where data are lacking, suitable habitat is assumed to be occupied.
- All routes provide the same level of disturbance, unless local data or knowledge indicate otherwise.
- All vehicle types result in the same amount of disturbance effect to wildlife.
- Effects to known sites are evaluated using existing data. Where occupancy is not confirmed, suitable habitat is assumed to be occupied.
- In the long-term, habitat on unauthorized routes that are not added to the NFTS will improve to some degree due to passive vegetation restoration.
- There is no road decommissioning planned or considered at this time under any alternative.
- The spatial boundaries of the analysis area encompass the entire forest. Effects to wilderness, private lands, other State or Federal non-NFS lands or large perennial water bodies are not expected to occur as a result of this action.

- Winter activities using snowmobiles or other over-snow vehicles are outside the scope of this project analysis. The effects of cross-country use by snowmobiles were not analyzed.
- The proposed mileage and dispersed nature of the changes in open road density make the effects of changes in road density immeasurable at the watershed and Forest scales; this indicator is not used for any group except ungulates.
- The area open to cross-country use (0-65 acres) in the action alternatives is so small in relation to the amount of suitable habitat for each evaluated species that this indicator does not provide a meaningful comparison of effects and is not discussed in detail.
- "Equivalent Acres" were calculated using an estimate of one linear mile of road/trail = 2 acres. This is a generous estimate for impacts to habitat and therefore effects may be overestimated.
- Buffers for noise disturbance were considered to be 0.25 mile on either side of a route. The size of the area affected by noise disturbance was calculated using 320 acres/mile of open route.
- ML2 roads, especially those with low levels of use such as occurs on the KNF, do not affect elk use of habitat.
- ML1 roads are closed to vehicle use year-round and therefore do not contribute to open road densities. They should not affect deer or elk behavior.
- Mapped acres of riparian habitat within riparian reserves are assumed to contain riparian vegetation or microhabitats suitable for all riparian focal species.
- Acres open and available to off-road motorized vehicle travel are considered to be those outside of wilderness or other areas administratively closed to vehicle use, and on slopes <35%.

Data Sources

- Forest-level GIS habitat layers produced from 2004 remote sensing imagery and processed in 2007 using the CALVEG classification system.
- Forest GIS layers comparing proposed routes with specific habitats and 'designated' or important wildlife areas.
- 1992 and 2008 NSO Suitable Habitat layers. (The 2008 NSO Suitable Habitat layer was used in the DEIS).

- Site-specific personal knowledge of agency biologists was used where Forest-level data were not current or not available.
- GIS layers for deer winter range and key elk habitats provided by California Department of Fish and Game (CDFG).
- U.S. Fish and Wildlife Service online list of Listed/Proposed Threatened, and Endangered Species for the Klamath National Forest, Document Number: 630980437-103625, October 20, 2008. No changes to listing status or no new species have been added since this date.
- California Wildlife Habitat Relationships program (CWHR version 8.0; California Department of Fish and Game, 2002).

Indicators

Each species group utilized a different set of indicators as noted below.

Late-successional species:

- Acres available for motor vehicle use within identified late-successional habitats
- Miles of unauthorized routes (Alternative 1) or miles of routes proposed for addition to the NFTS (action alternatives) in late-successional habitats
- Number of sensitive sites (location or site center for the most recent pair or territorial single) for TES species within ¼ mile of an added route or area
- Percent of Forest-wide habitat affected

Ungulates:

- Acres open to motor vehicle use within seasonal habitats; % of total habitat
- Miles of unauthorized routes (Alternative 1) or miles of routes proposed for addition to the NFTS (action alternatives) in seasonal habitats
- Number of 7th field watersheds in seasonal ranges with open road density > 3 miles/mi^2. Open road density includes NFTS roads + all routes open to vehicle traffic. For Alternative 1, all unauthorized routes are considered to be open roads.

Riparian species/Cavity dependent group/Hardwood group/Grassland & shrub-steppe group/Wide-ranging carnivores:

- Acres of habitat open to motor vehicle use
- Miles of unauthorized routes (Alternative 1) or miles of routes proposed for addition to the NFTS (action alternatives) in identified habitats
- Equivalent acres of riparian habitat affected by routes
- Percent of Forest-wide habitat affected

Methodology by Action

1. Direct and indirect effects of the prohibition on cross-country motorized vehicle travel

Short-term timeframe: 1 year.

Long-term timeframe: 20 years.

Spatial boundary: Klamath National Forest.

Indicators: See above.

Methodology: GIS analysis of existing unauthorized routes in relation to habitat.

2. Direct and indirect effects of adding facilities to the NFTS

Short-term timeframe*:* 1 year

Long-term timeframe*:* 20 years.

Spatial boundary*:* Klamath National Forest.

Indicators: See above

Methodology: GIS analyses of added routes, trails, and use areas in relation to habitat and important/sensitive terrestrial wildlife areas.

3. Direct and indirect effects of changes to the NFTS

This action is not addressed for wildlife because:

- Effects of changing allowed vehicle class and maintenance level are assumed to have no measurable effect on wildlife species; no direct or indirect effects are expected from adding mixed use (non-highway legal vehicles) on NFTS roads.

- Two routes (41N01 and 40N51) totaling about 10 miles were proposed to be changed from Maintenance Level 1 to Maintenance Level 2 in the Proposed Action. 40N51 was determined to already be an ML 2 road. It was constructed for the Olsen fire salvage sale, and closed by Forest Order in 2000 due to safety concerns. It is located in a remote area with fairly high road densities, and was reconstructed and re-opened for fire access and survey purposes. It has been open for several years and constitutes part of the current condition. 41N01 (the Doe Peak road) was constructed prior to the land coming into the National Forest System.. It was listed as closed (ML1) in INFRA and was gated, but was never closed under Forest Order. The gate has been ineffective for many years, and the road has been open to all vehicle types. It was analyzed for potential use under the Mt. Ashland EIS; the analysis indicated no sediment concerns because there is no connectivity to a stream, but no decision was made about appropriate maintenance level. This change would bring 40N01 into compliance with its operational maintenance level. Both of these actions are considered to be administrative changes that would not affect wildlife habitat or species.

4. Cumulative Effects

Short-term timeframe*:* not applicable; cumulative effects analysis will be done only for the long-term time frame.

Long-term timeframe*:* 20 years.

Spatial boundary*:* Klamath National Forest.

Indicators: (1) Miles of unauthorized routes (Alternative 1) or miles of routes proposed for addition to the NFTS (action alternatives) in identified habitats; (2) Number of 7th field watersheds with open road density > 3 miles/mi^2 (ungulates only).

Methodology*:* GIS analysis of current, added, and future routes in relation to habitat and important/sensitive terrestrial areas and in context of other ongoing and foreseeable management actions with similar effects on terrestrial habitat.

General Wildlife

The Klamath National Forest is situated in one of the most remote and biologically diverse areas in the Pacific Northwest, providing habitat for over 370 species of wildlife, including 92 mammals, 237 birds, 20 amphibians, and 23 reptiles. Two federally listed species and 20 sensitive species are known or highly suspected to occur on the KNF.

The composition and structure of forest, rangeland, and aquatic ecosystems has resulted in a mosaic of vegetative patterns containing a mixture of seral stages for forests and rangeland. The majority of the KNF (about 80 percent) lies west of Interstate 5, within the Klamath Mountains Geographic Province. This area contains complex vegetation patterns dominated by Douglas fir,

ponderosa pine, true fir and mixed conifer-hardwoods. Distribution of vegetation across the landscape is dictated by elevation, aspect, soil type, and climatic influences. The east side of the Forest (Goosenest Ranger District) lies in the more open, gentler terrain of the Cascades Province, encompassing portions of the Cascade Range and Modoc Plateau. The dominant forested vegetation type is east side ponderosa pine, often mixed with true fir, mixed conifer and lodge pole pine, with lower elevations on the district dominated by pine/juniper/sage/bitterbrush vegetation types. The Butte Valley National Grassland contains grassland habitats.

Natural openings occurring throughout the forest include rock outcrops, open rocky ridges, lakes, and meadow systems. Human created openings include roads, landings, mining sites, and harvested units (mostly replanted with conifers). Riparian and riparian-shrub habitats can be found throughout the landscape near lakes and ponds, along perennial streams, and along some intermittent streams. Important elements of riparian habitats include: predominance of deciduous woody plant communities, presence of surface water and soil moisture, diverse structural features (such as live and dead vegetation, water bodies, non-vegetated substrates), extensive edge providing structurally heterogeneous wildlife habitats, and distribution of aquatic habitat (i.e., streams and associated vegetation) in long corridors that provide protective pathways for wildlife migrations and movements between habitat blocks.

Wildlife habitat on the KNF is influenced by natural and human-caused forces. Fire is the dominant form of disturbance on the Klamath National Forest. Much of the KNF has been affected by wildfire, and some of those burned areas have been subsequently harvested and planted. Areas outside of wilderness have been altered by past timber harvest and road construction, particularly in areas with mixed public/private ownership (Scott River and Oak Knoll Districts) where private lands have been intensively managed for timber. This leads to a continuum of wildlife habitats subject to continual changes, many of which are difficult to accurately assess. Fire data from Region 5 between 2000 and 2008 suggest that approximately 68 percent of burned forested stands retained a “forested condition” after wildfire, where the stands as a whole remain intact (USDA 2009). In these areas, fires have burned at low and moderate severities such that residual forest structure is retained. Fire intensities and their effects vary based on a complex combination of factors including weather, fuels, and topography. In 2008, approximately 174,700 acres burned on the Klamath, much in wilderness, LSRs, and Riparian Reserves. Fourteen percent of the fire area was considered to have burned at high severity, and nine percent was considered moderate severity (based on RAVG fire severity mapping, D.Torpin, personal communication 2009). Moderate severity burns can be highly variable, displaying a mix of lethally burned patches intermixed with live vegetation. These types of burns contribute to a diversity of vegetative types, habitats, and forest patch sizes and age classes across the landscape. They also result in extremely high snag densities across the landscape.

Approximately 1.2 million acres of the KNF are open to motorized use, although, due to topography or legal restriction, large areas (primarily on the west side) are inaccessible or not available for off-road vehicle travel.

Management Indicator Species

Per the requirements in 36 CFR 219 (the 1982 Planning Rule), the KNF LRMP identified management indicator species (MIS) to be used in Forest level planning. These species were selected because their population changes were believed to indicate the effects of management activities on fish and wildlife populations. Six individual species and six multi-species associations were selected. The individual species (Northern spotted owl, American marten, fisher, black bear, Northern goshawk, and black-tailed deer) are either Threatened, Sensitive, or Forest Emphasis species, and are analyzed as such. The MIS associations are included in the focal species/associations analyzed in this document (Table TW-1), with the exception of the Mature Pine association (see Species not considered in detail, below). For more information on MIS, refer to the Klamath National Forest Travel Management MIS Report, which is included in the project files located in the Supervisor's Office in Yreka, California.

Species not considered in detail

Several species were not considered in detail in this document:

Western yellow-billed cuckoo: There is no habitat for this species on the Klamath National Forest, and no sightings have been documented.

The **Sierra Nevada red fox's** range includes the KNF but no confirmed locations in the Klamath Province have been recorded since the early 1900s. All recent locations have been in the Lassen Peak vicinity (Figura, personal communication 2009). Additional information can be found in the Biological Evaluation for Sensitive Species, located in the project record.

Bald eagles are common during migration and in winter along major river systems such as the Klamath and Scott Rivers, in agricultural areas such as Scott Valley, and near water bodies on the Goosenest District. Nine nest sites and four roost sites occur on the KNF. The Region 5 route designation project design criteria for threatened and endangered species requires that staging areas and routes within ½ mile of occupied bald eagle nests be closed during the nesting season (January 1 to August 31 or 3 weeks after chicks are known to have fledged), and staging areas and routes within ¼ mile of known winter roosts be closed from November 15 to March 15. No currently unauthorized routes or routes proposed for addition to the NFTS occur within winter roost protection areas or sites. There are two short routes to dispersed recreation sites located within ½ mile of identified eagle nest areas on the Goosenest District. One route is almost ½ mile away, and is on the other side of State Highway 97. The second route is separated from the nest area by a County road and railroad tracks that receive regular use. The Goosenest

District biologist confirmed that irregular use on the unauthorized routes would not create measurable effects on eagle behavior due to the more frequent disturbances caused by vehicle and train traffic closer to the nests. Therefore, no seasonal restrictions are required (Cheyne, personal communication, 2009). No effects to bald eagles are expected to occur from adding these routes to the NFTS.

While some effects could occur if cross-country motor vehicle travel continues, there is no indication that this activity is currently affecting bald eagles in any way. Therefore, there will be no further analysis of effects to bald eagles in this document. Refer to the Biological Evaluation located in the project record for further details.

Great grey owls are dependent on meadows for foraging, and on old growth red fir, mixed conifer, or lodgepole pine for nesting (CDFG 1990). Most commonly associated with wet meadows of the Sierra Nevada, they have also been occasionally documented in northwestern California in winter and in the Warner Mountains in summer (McCaskie, et al. 1988); in more mesic sites within the Applegate River drainage to the north of the KNF, and within 20 miles to the northeast on the Dead Indian Plateau of southern Oregon (Godwin pers. comm. 2005, cited in USDA 2008). Intermittent surveys for great grey owls have been completed on the Forest, but there have been no observations of pairs or individuals. Suitable habitat is considered to be mature and late-successional conifer stands (included in NSO nesting/roosting) with the addition of eastside pine and lodgepole pine that occur within 250 meters of meadows above 5,000 feet. This habitat is highly congruent with marten habitat. Potential effects to great grey owl habitat are represented in the late-successional species group and are not described in detail in this document. Refer to the project Biological Evaluation located in the project record for further information.

Wolverine sightings range from Del Norte and Trinity Counties east through Siskiyou and Shasta Counties, and south through Tulare County. Habitat distribution in California is poorly known for the North Coast and northern Sierra Nevada. Camera stations and track plate surveys have been conducted on the KNF, but did not find wolverine. There are 10 reliable detections of wolverine on the Klamath National Forest within the last 20 years (USDA 1995) but no den sites are known. Potential effects to wolverine are represented in the late-successional species group, and are not described in detail in this document. Refer to the project Biological Evaluation located in the project record for further information.

Tehama chaparral snail, blue-grey tail dropper, Siskiyou Mountain/Scott Bar salamander: These species are found beneath the surface for the majority of the year (Weasma 1999) and are unlikely to be disturbed by noise or vehicle traffic. Off-road use typically does not occur on talus-dominated sites associated with the salamanders. Due to the limited occurrence and/or the subterranean life history of these species, it is possible but highly unlikely that they are

affected by current off-road use, or would be affected in future by vehicle use of routes added to the NFTS. There would be no effect to habitat or individuals under any alternative; these species are not addressed further in this document. Refer to the project Biological Evaluation located in the project record for further information.

The **tailed frog** is found in remote areas with clear, fast-flowing streams and rivers in montane regions throughout the project area. It is specifically associated with conifer-dominated habitats and montane hardwood-conifer habitats, more commonly in mature or late-successional stands than in younger stands. Suitable habitats most likely occur in areas not accessible by OHVs. Due to its restricted habitats, it is possible but highly unlikely this species could be affected by off-road travel under Alternative 1. No routes proposed for addition to the NFTS would affect habitat for this species. There would be no effect to habitat or individuals under any alternative; this species is not addressed further. Refer to the project Biological Evaluation located in the project record for further information.

American dipper, northern water shrews, and Cascade frogs are associated with habitats similar to those utilized by the northern red-legged frog and western pond turtles, which have been selected as focal species for the riparian dependent species group. Potential effects of all alternatives to these species are represented in the riparian dependent species group. Refer to the project MIS report located in the project record for further information.

Flammulated owl and **pinyon jay** are MIS representing the mature east-side pine association. This is a very restricted habitat type; extant mature east-side pines are those that escaped railroad logging early in the century due to their location on steep, inaccessible slopes. Mature pine do not occur on lands accessible to off-highway vehicles, and there are no unauthorized routes that enter or pass within ¼ mile of these stands. There would be no effect to habitat or individuals under any alternative; these species are not addressed further. Refer to the project MIS report located in the project record for further information.

Loggerhead shrike, **sage thrasher,** and **montane vole** are associated with grassland and shrub/steppe habitats. Effects from all alternatives to their habitats are described in the grassland shrub/steppe group, with emphasis placed on the three species that represent the range of habitats and natural histories within that group (pronghorn, burrowing owl and Swainson's hawk). These species are not addressed further. Refer to the project MIS report located in the project record for further information.

Southern torrent salamander has a limited distribution in northwestern California and is strongly associated with cold mountain streams, springs, and seepages in headwaters and low order tributaries. These are found in steep areas on the west side of the KNF that are generally inaccessible to vehicles, so no effects would be expected from cross country motorized travel. None of the action alternatives include routes in this habitat type; there will be no effect on the

southern torrent salamander under any action alternative. Refer to the project Biological Evaluation located in the project record for further information.

Downy, hairy, and white-headed woodpeckers, and Vaux's swifts are widely distributed throughout the Forest. Effects from all alternatives to potential habitats for these species are described in the cavity dependent species group, with emphasis placed on the three species that represent the range of habitats and natural histories within that group (pileated woodpecker, red-breasted sapsucker, and pallid bat). Refer to the project MIS report located in the project record for further information.

The **black-backed woodpecker** is strongly associated with recently burned areas. Population numbers are highly influenced by the availability of snags following wildfires. Vehicle use of the KNF would not affect this species or its habitat; it is not addressed further. Refer to the project MIS report located in the project record for further information.

Townsend's big-eared bat is strongly associated with cave systems and large rock outcroppings. Most of the cave systems are located in remote areas of the KNF or in wilderness and are inaccessible to OHVs, with the exception of the cave system occurring about 0.7 mile from the proposed Juniper Flat use area. That area has been closed to off-road travel for several years under a Forest Order; even if Alternative 1 was selected, the Order would remain in effect. There should be no effects to this species under any alternative. Refer to the project Biological Evaluation located in the project record for further information.

Affected Environment

Late-Successional Forest Associated Species (Focal species: northern spotted owl, marbled murrelet, northern goshawk, Pacific fisher, American marten)

This species group is associated with mature to old forests that contain late-successional characteristics. These characteristics include large trees for a given growing site, relatively high canopy closure, elevated amounts of decadence in the form of snags (standing dead trees), down logs, in-tree decay and deformity. Brief descriptions of suitable habitats and distribution across the Forest is discussed below but further detail can be found in the Klamath National Travel Management Biological Assessment for Proposed, Listed, and Candidate Species or the Biological Evaluation for Sensitive Species. Most, but not all, of the late-successional habitat is contained in the designated Late-Successional Reserves (LSRs) on the KNF. Management objectives within LSRs are designed to protect and enhance conditions of late-successional and old growth forest ecosystems, which serve as habitat for the focal species addressed in this analysis. Eighteen large LSRs were mapped as part of the Northwest Forest Plan in addition to eighty-seven 100-acre LSRs located around known spotted owl activity sites. Dispersal habitat and connectivity outside of reserves is provided throughout the landscape by remaining patches

of late-successional habitat, riparian reserves, and undeveloped lands in backcountry, roadless and wilderness areas. The KNF supports about 475,000 acres of late-successional habitat.

The Managed Wildlife Area near Happy Camp provides habitat for species dependent on structural features common to late-successional habitats. This 6,600-acre management area is to be managed for habitat attributes to provide moderate to high quality habitat conditions per the Fisher Habitat Capability Model. No unauthorized routes within this management area are proposed in any action alternative, although one route to a dispersed recreation site (52-10) lies just to the west of the management area boundary.

Northern spotted owl (*Strix occidentalis*) is managed in accordance with the direction found within the Klamath Land and Resource Management Plan (USDA Forest Service 1995) which incorporated direction from the 1992 Draft Recovery Plan (USDI 1992). Within large LSRs, 316,780 acres of critical habitat for northern spotted owls has been designated. A small proportion of critical habitat occurs within regulated lands (lands open for vegetative management). Locally defined suitable nesting and roosting habitat for NSO is defined as: mixed conifer stands below 6,000 feet in elevation with an overstory of Douglas-fir, ponderosa pine, sugar pine, incense cedar, white fir and/or red fir averaging at or above 18 inches dbh; an understory composed of these same conifers plus hardwoods; a total canopy cover of 60-100 percent; a minimum of two to five snags (average dbh 18 inches) and two to five down logs (average diameter at large end, 18 inches) per acre; the presence of deformed trees (mistletoe, heart rot, etc.); and sufficient open spaces below the canopy for owls to fly (USDA Forest Service, 2003). Most nests on the KNF are found in mistletoe clumps in large diameter Douglas-fir trees, with a small percentage occurring in snags. A large portion of the KNF has been surveyed to protocol at least once in the last 10 years through timber sale surveys, other project surveys, and administrative studies. Survey efforts have identified 290 NSO activity centers on the Forest. NSO suitable habitat is considered to be equivalent to identified LS habitat (about 475,000 acres), of which about 69,000 acres are available for cross-country motorized travel.

The northern goshawk *(Accipiter gentilis)* is a forest hawk with similar habitat needs as the spotted owl; however, territories on the Goosenest District can also be found in mature ponderosa pine/mixed conifer, and higher elevation mature red fir stands. Foraging habitat is variable and includes mid- and late-successional forest, natural and man-made openings, and forest edges. Approximately 69 goshawk activity centers are mapped on the west side of the Forest and 41 on the Goosenest Ranger District. For this analysis, suitable habitat for goshawks is considered to be equivalent to identified LS habitat. Additional details of species life history and habitat associations is provided in the Travel Management BA/BE.

Marbled murrelets *(Brachyramphus marmoratus)* are generally associated with large trees that have large lateral branches, extensive mistletoe infection, witches brooms, and a mature

understory that extends into the canopy. These elements provide nesting substrate. Such characteristics usually do not develop until trees are 150 to 175 years of age. For the purposes of this document, suitable murrelet habitat is considered to equivalent to suitable spotted owl nesting/roosting habitat. The Forest Ecosystem Management Team report (USDA et al. 1993) identified two zones based on observed use and expected occupancy. Zone 1 is close to the marine environment and is associated with most known murrelet activity (USDA and USDI, 1994). This zone extends approximately 25 to 35 miles inland and includes the western-most portion of the Happy Camp District. There are 63,940 acres of marbled murrelet critical habitat within mapped LSRs in Zone 1 (Runaway LSR, and a portion of Seiad LSR). There are no unauthorized routes within Zone 1 or identified critical habitat proposed for addition in any action alternative, so effects on this area are confined to Alternative 1 and are not discussed in the action alternatives. Zone 2 occurs from approximately 35 to 45 miles inland and is less likely to support murrelets. An estimated 71,300 acres of suitable habitat exist on the KNF in Zone 2. Due to the steep slopes on which much of this habitat occurs, only about 12,000 acres are available for cross-country motorized travel.

Pacific fisher *(Martes pennanti)* (Forest Service sensitive species; also a candidate for Federal listing) are scarce residents in California. Fisher habitat distribution occurs from Del Norte and Trinity counties east through Siskiyou and Shasta Counties, and south through the Sierra Nevada to Tulare County (CDFG 1990). Surveys over the past decade have detected fisher at many locations on the west side of the KNF, most commonly in mid-to late-seral mixed conifer habitats between 3,000 and 6,000 feet (Farber and Criss unpublished data 2006, Farber and Franklin, unpublished data 2005, Finley, personal communication 2009). Incidental sightings of fisher have also occurred in several locations, for the most part along major roads and highways associated with rivers or large creeks, but no den sites have been located. No confirmed sightings occur on the Goosenest District. In a study on Hoopa Tribal Lands and on the Shasta Trinity National Forest, fishers selected sites made up of stands with large diameter trees, and dense canopy cover generally situated in drainage-bottoms (Yaeger 2005). They also used black oak more than expected (S. Yeager, pers. comm. 2005). Habitat capability models indicate that habitat characteristics meeting moderate to high capability for NSO also meet requirements for high capability habitat for fisher (USDA Forest Service 1995). Therefore, for this project, suitable denning/resting/foraging habitat for fisher was considered to be equivalent to NSO habitat.

American marten (*Martes americana)*. Optimal habitats for marten are various mixed evergreen forests with more than 40 percent crown closure, with large trees and snags. Important habitats include red fir, lodgepole pine, subalpine conifer, mixed conifer, Jeffrey pine, and eastside pine (Grinnell et al. 1937, Schempf and White 1977, Clark et al. 1987, as cited in CDFG 1990). On the Klamath, marten have been observed in higher elevations on the forest, typically within true fir, lodgepole pine, and subalpine conifer stands. For the purposes of this analysis, NSO habitat above 4500 feet is considered suitable habitat for marten. Standards and guidelines

for both species provide require retaining canopy cover and include retention of large down logs and snags. An estimated 144,500 acres of marten habitat occurs on the KNF. Due to the high elevation and steep slopes on which much of this habitat occurs, only about 25,700 acres are available for cross-country motorized travel.

Ungulates (Focal species within the group: elk and black-tailed deer)

Elk and black-tailed deer are not associated with any one type of habitat, but with a wide variety of rangeland, forest, and brushfield habitats.

Elk is a special emphasis species. The Klamath NF is located within the historic ranges of both Rocky Mountain elk and Roosevelt elk. Reintroduction efforts between 1985 and 1996 brought 232 animals from locations in California and Oregon to four locations on the western side of the Forest. Biologists categorize the elk into 2 populations comprised of 10 distinct herds: the Marble Mountains population (8 herds) on the west side of the Forest, and the Goosenest population (2 herds) in the Southern Cascades on the east side (Allison et al. 2007).

The eight distinct herds of the western population vary their elevational range and utilize a variety of habitats, mostly on public lands. Summer range is predominately in the high mountain meadows of the Marble Mountain Wilderness, and parts of the Trinity Alps and Russian Wildernesses. Transition range is a broad elevation band between the summer and winter range, comprised of Douglas-fir and mixed evergreen types at lower elevations grading into white fir types at higher elevations. Within this conifer matrix, there are occasional brush fields associated with ridge tops, avalanche chutes and ecological disturbances. Winter range is typically below 2500 feet elevation and is within the Douglas-fir/tan oak and mixed conifer zone. Steep rocky slopes of southerly aspects commonly have canyon live oak as the major hardwood. Remnant deciduous oak woodlands provide valuable grass and forb forage. The greatest forage utilization in the winter range occurs along the river bars and terraces of the Klamath River, Elk Creek, and Salmon River. Oak woodlands, younger conifer plantations, small meadows, and grassy road rights-of-way and openings, often on private property, are utilized during the winter season.

The two distinct herds of the Goosenest population have characteristics of both Rocky Mountain and Roosevelt elk. These animals are not a result of planned reintroductions, but rather a result of natural population expansions from Oregon herds. They range from the eastern foothills of Shasta Valley north to the Klamath River, and south and east to Deer Mountain, spending most of the winter on private ranches in the Shasta Valley. The gentle slopes from Eagle Rock to the Klamath River above Copco Lake offer many patches of oak woodlands and grasslands. In the spring the elk move south and east to transition and summer ranges around Grass Lake, Bull Meadows and Deer Mountain. The second herd’s primary winter range is valley lands, including Pleasant Valley, west of Highway 97, Butte Valley National Grasslands, Butte Valley Wildlife Area and private ranches. The majority of the high quality winter range is located

in the uplands immediately adjacent to the valley floor along the southern boundary. The Goosenest winter range contains the highest percentage of high quality forage. In the summer, elk range throughout the mountains to the west and north of Butte Valley and are assumed to go into Oregon. Much of this habitat is drier and typical of eastside pine or juniper woodland habitats interspersed with small glades associated with riparian areas (Allison et al. 2007).

Elk utilize the entire KNF. For the purposes of this analysis, summer range (770,000 acres) is combined with transition range (697,000); the combination is addressed as seasonal ranges. There are about 463 miles of unauthorized routes within these seasonal ranges. Winter range comprises about 223,000 acres, and contains about 34 miles of unauthorized routes. The number and mileage of unauthorized routes in most 7th field watersheds within seasonal ranges are low; these routes do not significantly affect open road density. Watersheds where road densities may be of concern are those with a substantial number of unauthorized routes and open road densities exceeding 3 miles per square mile. There are 37 such watersheds on the KNF.

Black Tailed Deer (management indicator species) are widely distributed on the Forest. This species utilizes a variety of habitats during different times of year, with high-quality winter range being the most important. California Department of Fish and Game has identified 509,000 acres of deer winter range in Siskiyou County, with 220,000 acres of this range located on National Forest System Lands. Winter ranges in Siskiyou County contain some of the highest known densities of black tailed deer in California (Siskiyou County Deer Management Technical Working Group 2009). Critical winter ranges are unique and essential habitats located within the general winter ranges of deer, and are required during the harshest winters when deer are forced to the lowest elevations. Critical winter ranges are utilized by deer annually, but the intensity of use can vary greatly depending on the severity of the winter. Land conversion and development, particularly in winter ranges, has been identified by California Department of Fish and Game as a threat to sustainable deer populations in the state. The KNF has identified specific management areas for deer management including 108,000 acres of summer/fawning habitat.

In the 1990s, CDFG established deer assessment units (DAUs) for monitoring deer in California. DAUs are based on groups of deer that live in similar yet distinct habitat and environmental settings (CDFG 2006 cited in Siskiyou County Deer Management Technical Working Group 2009). Each DAU consists of multiple zones that can encompass many herds or populations over large geographic areas or ecological provinces. Overall, countywide data (including KNF lands) suggest population declines, imbalanced population structures, and poor herd productivity. Limited presence of male deer and areas lacking high quality habitat are noted as primary causes of declines (Longhurst 1952; Dasmann 1971; Schaefer et al. 2002; CDFG 2006 cited in Siskiyou County Deer Management Technical Working Group 2009).

The Habitat Capability Model used in the KNF LRMP (USDA Forest Service 1995) indicates that open road densities of <1.5 mile per square mile are required for high habitat capability for deer. Densities over 3 miles per square mile are low capability. Unauthorized routes contribute to open road densities. About 180 miles of unauthorized routes occur in seasonal deer ranges, with 112 miles identified within winter ranges. There are currently thirty-eight 7th field watersheds in seasonal elk ranges with open road densities exceeding 3 miles per square mile; 19 of these are in identified deer winter range, and 32 are within deer summer range (there is some overlap between ranges - Table TW-2). These watersheds have low capability for ungulate habitat.

Table TW-2. Watersheds with Low Habitat Capability for ungulates (open road densities exceeding 3 miles/mi$^{2)}$.

Watershed	Open road density in miles/mile^2	Deer seasonal range
Antelope Sink	3.48	winter/summer
Antelope Well	3.00	winter/summer
Beaver-Grouse*	3.54	
Benjamin-Wingate	3.07	winter/summer
Buckhorn	4.68	winter/summer
Butte Ck Headwaters	3.02	summer
Collins-Lime	4.06	winter
Deadwood	5.66	winter/summer
Deer-Beaver	5.58	summer
Dock Well	3.59	summer
Doggett	5.96	winter/summer
East Fork Horse	3.40	summer
Garner Mtn	3.85	winter/summer
Grass Lake NE	3.09	summer
Grouse Hill	3.34	summer
Haight Mtn	4.20	summer
Hill 22	3.40	winter/summer
Hoop & Devil	3.11	winter/summer
Jaynes Canyon	4.92	summer
Little Humbug	3.52	winter
Long John	4.13	
Lower First	4.92	summer
Lower Horse	3.50	winter/summer
Main Horsethief	3.08	winter/summer
Middle Fork Humbug	4.59	winter/summer

Watershed	Open road density in miles/mile^2	Deer seasonal range
Mud Lake	3.42	winter/summer
Muskgrave	3.28	winter/summer
Negro-Hotelling	3.28	winter
Pollic Flat	3.09	summer
Tamarack Flat	3.16	summer
Tennant-Antelope Ck	4.31	summer
Trapper Ck	3.88	summer
Upper Antelope	3.09	summer
Upper First	4.96	summer
Upper Fish-Browns	3.07	summer
Upper Humbug	5.58	winter
Upper Shovel	3.57	summer
Van Bremmer Well	4.62	winter/summer

***Watersheds not shown in deer seasonal ranges are within elk seasonal ranges**

Riparian Dependent Group (Focal species: willow flycatcher, northwestern pond turtle, northern red-legged frog, tailed frog, and long-tailed vole)

This group represents the diverse assemblage of riparian habitats found on the Klamath NF.

Willow flycatcher (*Epidonax trailii*) is listed as both FS sensitive and MIS on the Klamath. These are neotropical migrants found in riparian habitats of various types and sizes, ranging from small willow surrounded lakes or ponds with a fringe of meadow, to grasslands, to willow lined streams or boggy areas. Very little historical information on the Klamath Mountains exists, but since 1994, the Klamath has been conducting systematic mist net surveys to determine local distribution of willow flycatchers on the Oak Knoll and Goosenest Ranger Districts. Seasonal fluctuations throughout the breeding season are reflected by the high numbers caught in the early and late summer. Data suggest breeding does take place nearby, possibly in the Marble Mountains, or in suitable habitat within the Horse Creek Watershed or along the Klamath River. Approximately 3,234 acres of potential habitat for willow flycatchers exists in riparian deciduous shrub habitat along streams on the Forest.

Northwestern pond turtles (*Actinemys marmorata*; FS Sensitive), and **northern red-legged frogs** (*Rana aurora*; MIS) are commonly found in or adjacent to quiet pools of rivers, streams, marshes, and occasionally ponds. Turtles require upland terrestrial habitats for nesting. Nest sites generally occur within ¼ mile of water sources, and are usually characterized as open areas dominated by grasses and herbaceous annuals with a southern exposure. Western pond turtles and red-legged frogs have been observed in the habitats described above, most frequently in the Klamath River system and in montane ponds. Aquatic and riparian habitats are protected by

standards and guidelines for riparian reserves (USDA 1995). **Long-tailed vole** (*Microtus longicaudus*; MIS) is a small riparian-dependent mammal found in herbaceous understories of many forest habitats; abundant in montane riparian, as well as fresh emergent wetland, cropland, aspen, grassland, and wet meadow habitats. Approximately 9,270 acres of riparian vegetation and 2,500 miles of perennial rivers, streams, and creeks (KLRMP (1994) occur on the KNF. Distribution of these three species is unknown.

Greater sandhill cranes (*Grus canadensis*; FS Sensitive) breed in wetlands and feed in meadows, irrigated pastures, grain fields, bogs, fens, marshes, and nearby fields. Cranes roost at night in open expanses of shallow water. Greater sandhill cranes summer in a broad belt across North America from the Great Lakes to the west coast, north to British Columbia, Alaska and eastern Siberia. Sandhill cranes nest in montane meadows in California from central and eastern Siskiyou County, east and south to Modoc, Lassen, and northern Plumas counties. Large populations of wintering birds can be found in the central valley from Shasta County south to Fresno County. Declines in the number of breeding sandhills in portions of their range and breeding habitat losses in both Oregon and California resulted in the population being classified by the U.S. Fish and Wildlife Service, Region 1, as a sensitive species in 1982 and a California threatened species in 1983. California also listed the crane as a fully protected species (CDFG 2008). Three pairs of greater sandhill cranes have been observed on the Goosenest Ranger District, but no nest sites or breeding areas have been documented on the KNF. Cranes may use open water and meadow habitats at Orr Lake, Bull Meadows and First Spring, but there is no delineated suitable habitat for this species on the KNF. Three sightings of cranes have occurred on the KNF, none within 1 mile of any unauthorized route. Cranes may be affected by impacts to riparian habitats, but the level of effect is difficult to quantify. For this analysis, impacts to potential habitat for cranes is considered to be congruent with that of other riparian-dependent species and is displayed along with effects for western pond turtle.

Foothill yellow-legged frog (*Rana boylii*; FS sensitive) is a moderate sized frog typically light and dark mottled grey, olive, or brown, often with variable amounts of brick red. Historic distributions ranged through most Pacific drainages west of the Sierra/Cascade Crest from the Santiam River, Oregon to the San Gabriel Drainage in southern California (Jennings and Hayes 1988, in CDFG 1990). They are typically found at elevations below 1800 feet (Corkran and Thoms, 1996). Current distribution and abundance of this species has been reduced drastically in the southern portion of its range, but they still occur in significant numbers in some coastal drainages. Listed as a California species of special concern, the foothill yellow-legged frog is at risk due to various anthropogenic and environmental threats throughout its range. In some of the larger rivers in California, predation by introduced bullfrogs has been implicated as a cause of their decline. Increased sediment loads in breeding streams may reduce survival of eggs. Breeding occurs in the spring, where adults congregate in habitats consisting of shallow, slow flowing water with pebble and cobble substrate, preferably with shaded riffles and pools (Fuller

and Lind, 1992). This species is also known to utilize moderately vegetated backwaters, isolated pools, and slow moving rivers with mud substrates. No formal surveys have been conducted on the KNF but suitable habitat can be found in streams throughout the Forest.

Grassland/Shrub-Steppe (Focal species: Swainson's hawk, pronghorn, burrowing owl)

The grassland/shrub-steppe group is found on the Butte Valley Natural Grasslands (BVNG) on the Goosenest district. Farming, grazing, and flood control projects in the early part of this century dramatically altered the historical perennial grasslands, seasonal wetlands, and open sagebrush-steppe vegetation. However, some restoration of these habitats has occurred over the last twenty years through habitat management projects in some areas of the BVNG and the adjacent state-owned Butte Valley Wildlife Area. The KNF supports about 10,600 acres of grassland-shrub/steppe habitats.

The **Swainson's hawk** (*Buteo swainsoni*) is a raptor that breeds in the plains and grasslands of the western United States and portions of Canada and Mexico. In North America, this species is associated with grasslands, shrub-steppe and agricultural habitats. In many areas, Swainson's hawks have adapted to farmed habitats, particularly alfalfa fields, nesting in windbreaks and farmstead trees. Nests may also be built in riparian forests, shrubs or on the ground in areas where trees are lacking. Nest tree selection is dependent on proximity to foraging habitats that are entirely different from the vegetation selected for nest sites (Woodbridge 1998). The hawks prefer semi-open and open habitats that facilitate aerial foraging. Over the last few decades a rapid loss and modification of habitat for Swainson's hawks has been occurring throughout its range, especially in the California Central Valley (Anderson et al. 2007). In the fall, the hawks migrate south to the pampas of Argentina, where they roost and forage in large groups, feeding primarily on grasshoppers found in pastures, alfalfa, and sunflower fields. Significant effects of pesticide use on Swainson's hawks wintering in the pampas of Argentina were reported by Woodbridge et al. (1995) and Goldstein et al. (1997, as cited in Woodbridge 1998). Farmer education programs and restrictions on use of highly toxic organophosphate pesticides implemented by government and industry appear to have dramatically reduced the impacts of these compounds on wintering Swainson's hawks (Woodbridge 1998).

Surveys in 2005 and 2006 estimated 2,081 breeding pairs in California, with about 95 percent occurring in the Central Valley (Anderson et al. 2007). Swainson's hawks use most or all of the 10,600 acres of grassland habitats on the KNF, with some use occurring in the 14,000 acres of juniper habitats that occur adjacent to the grasslands. Fifteen nests occur in the Butte Valley National Grassland (BVNG), all located within ¼ mile of unauthorized routes. The routes were built in the 1930s when BVNG was a Land Use Allotment, and have been used by range managers, special use permittees, and the public (one is a birding route) since that time. The hawk nests have a history of reproductive success, indicating that the birds are well habituated to

human disturbance and vehicle noise. Additional territories are known to occur on private lands in Butte Valley (Cheyne, personal communication, 2009). Swainson's hawk pairs in Butte Valley frequently select different nest trees each year; nests commonly occur adjacent to farm roads or county roads (Woodbridge, personal communication, 2009).

Pronghorn (*Antilocapra americana*) occur on the Goosenest Ranger District, inhabiting the low rolling topography of agricultural areas, sagebrush, bitter brush, grassland, and alkali desert scrub habitats found in the Butte Valley National Grassland. This species forages on forbs and several brush species including sagebrush. Pronghorn prefer habitat with low vegetation and 5-20 percent shrub cover (USDA Forest Service 1995). Kidding habitat includes sagebrush, alfalfa fields, and tall grass. There are 2,750 acres of pronghorn kidding habitat identified on the KNF.

Burrowing owls (*Athene cunicularia*) are yearlong residents of open, dry grassland and desert habitats; and in grass, forb and open shrub stages of pinyon-juniper and ponderosa pine habitats. The conversion of grassland to agriculture, the invasion of non-native plants, and poisoning of ground squirrels have contributed to the reduction in numbers in recent decades (CDFG 1990). Burrowing owls have been known to occur at 6 locations on the Butte Valley National Grasslands, but intermittent surveys have not located colonies since 1996. Feathers and other sign of presence were observed in 2007 at one site (Cheyne, personal communication, 2008).

Snag/Cavity Dependent Group (Focal species: white headed woodpecker, red-breasted sapsucker, pileated woodpecker, and pallid bat)

This species group is associated with cavities in trees, and trees with large dead branches and broken tops. A variety of cavity-dependent species occur on the KNF. All species represented here are MIS, except for the pallid bat, a Forest Service sensitive species. Snags are generated by fires, drought, and insect or disease outbreaks, all of which have occurred on the Forest within the last 25 years. The fire ecology of the KNF creates a regular supply of snags distributed irregularly over the landscape. The relative numbers of hard and soft snags in various size classes vary. LRMP management guidelines focus on providing moderate capability habitat (snag numbers ranging from 2 to 5 per acre across the landscape), although snag numbers are much higher in areas subjected to wildfire during the past 50 years.

Pileated woodpeckers (*Dryocopus pilieatus*) require large snags for nesting and roosting. They are found in mature mixed conifer, Douglas-fir and true fir types containing large snags, stumps, and logs for foraging and cover. These large woodpeckers are uncommon, yearlong residents of mature, montane conifer habitats in the North Coast, Klamath, Cascade, and Sierra Nevada Ranges (CDFG 1990), and have been often observed throughout the KNF (Johnson, personal observation).

White-headed woodpeckers *(Picoides albolarvatus)* are common, yearlong residents of montane coniferous forests and lodgepole pine and red fir forests in the Sierra Nevada, Cascade, Klamath, Transverse, and Peninsular Ranges, and Warner Mountains. They are occasionally found at lower elevations along North Coast and in interior areas (McCaskie et al. 1988, in CDFG 1990). These woodpeckers excavate nests in broken-topped snags that are completely dead, and in stumps. The nest is generally close to the ground in moderately to extensively decayed wood (Raphael and White 1984, Milne and Hejl 1989, cited in Hillis et al., undated).

Red-breasted sapsuckers (*Sphyrapicus rubus*) are uncommon to fairly common yearlong or summer residents in openly wooded, mountainous parts of California. They occur from northwestern British Columbia, along the coasts and both the eastern and western slopes of the Cascade Range and Sierra Nevada south to Kern County; and from Del Norte County east into Modoc County (CDFG 1990). Nesting habitats include montane riparian, aspen, montane hardwood-conifer, mixed conifer, and red fir; especially near meadows, clearings, lakes, and slow-moving streams. In northwest California, Raphael and White (1984) found the majority of nests in snags or dead portions of live trees. Some populations of the sub-species occurring in California are migratory, wintering in foothills or lower elevation areas from where they breed (Walters et al. 2002). This species is frequently found along oak and mixed conifer woodlands on the Klamath, Scott, and Salmon Rivers, and is commonly associated with old homesteads containing old fruit trees (Johnson, personal observation).

The pallid bat (*Antrozous pallidus*) is usually found below 6000 feet (Philpott 1997). Populations have declined in California within desert areas, in areas of urban expansion, and where oak woodlands have been lost (Brown 1996). This species, like many other bats, is extremely sensitive to disturbance at roosting and nesting sites. A variety of habitats are used, including grasslands, shrublands, woodlands, and coniferous forests (Philpott 1997). Pallid bats are most common in open, dry habitats that contain rocky areas for roosting. They are a yearlong resident in most of their range and hibernate in winter near their summer roost (CDFG 1990). Pallid bats are unusual in that most of their food consists of large insects captured on the ground (Verts and Carraway 1998). Day roosts may vary but are commonly found in rock crevices and tree hollows; and have been documented in large conifer snags, inside basal hollows of redwoods and giant sequoias, and bole cavities in oaks (Sherwin 1998). Cavities in broken branches of black oak are very important and there is a strong association with black oak for roosting (Pierson 1996). The large diameter snags found throughout the Forest provide suitable habitat for the pallid bat, although their distribution is unknown.

Hardwood / Hardwood Mixed Conifer (Focal species: acorn woodpecker and western grey squirrel)

California black oak and Oregon white oaks are important vegetation types and habitat components for this group because they provide an abundant and high quality food resource.

Mature oaks are also an important source of cavities that provide nesting and roosting habitat. Vegetation management projects leave hardwoods as leave trees whenever possible. Pure stands of hardwoods are not intended to be managed as part of the timber component. Approximately 63,100 acres of hardwood habitats are estimated to occur on the KNF.

Acorn woodpeckers (*Melanerepes formicivorus*) are a common yearlong resident in hardwood and hardwood-conifer habitats, requiring open-canopied stands with large oaks and snags. Range extends through the western Sierra Nevada foothills, Coast Ranges, Klamath Range, and locally on the eastern Sierra Nevada slope from Modoc County to Nevada County (CDFG 1990). On the KNF, the woodpecker is commonly found in the hardwood stands along the Klamath, Scott, and Salmon Rivers.

The **western grey squirrel** (*Sciurus griseus*) is fairly common locally in mature stands of most conifer, hardwood, and mixed hardwood-conifer habitats in the Klamath, Cascade, Transverse, Peninsular, and Sierra Nevada Ranges (Ingles 1965, in CDFG 1990). This squirrel is commonly found in lower elevation mixed-conifer and mixed-conifer hardwood stands on the KNF.

Wide-Ranging Carnivores (Focal species: black bear)

Carnivores are important indicators of ecosystem integrity in that they influence the structure and reflect the vigor of the prey species upon which they depend. Many large and mid-size carnivores are unique in their response to human-caused habitat changes due to their large spatial requirements and their sensitivity to the effects of landscape patterns, including such factors as road and edge density (Buskirk and Zielinski 2003). While some mammalian carnivores, such as coyotes, have adapted to the presence of humans, others are documented or suspected to be adversely impacted by disturbance. Black bears occur throughout the KNF and utilize a variety of habitats and seral stages. Black bear was selected as a MIS due to its habitat associations with both early and late seral habitats and its need for large down logs for foraging and denning. While bears are known to utilize a range of habitats, they are most strongly associated with mature mixed conifer, mature dense mixed conifer, and early seral habitats; approximately 907,500 acres of these vegetation types are found on the Forest.

Environmental Consequences

Effects Common to All Species Groups

Motor vehicle use of roads and trails affects wildlife, directly and indirectly, in a variety of ways that can generally be placed into three categories: effects resulting from human-caused injury or mortality; effects resulting from changes in behavior (disturbance-based); and effects resulting from habitat modification or loss.

Speeds of vehicles traveling off established roads, and on ML2 roads are generally low. The potential for human-caused injury or mortality from this type of vehicle use is limited. It is addressed for those species groups where it may have an effect.

Effects to a species may occur as a result of noise disturbance when vehicle activity occurs within suitable habitat or adjacent to known sites. Effects are virtually impossible to measure in uncontrolled settings (1.2 million acres on the KNF are available for off-road travel). Effects due to noise disturbance are not expected in areas where noise levels generated by the project do not exceed ambient levels. Many unauthorized routes (especially short routes leading to dispersed recreation sites) are associated with designated ML2 or ML3 roads which receive regular motorized use, and individuals using habitat within 400 meters of these roads are expected to be habituated to vehicle noise. In addition, all unauthorized routes have received some level of repeated motorized use for years. Noise associated with motorized use of these routes is considered “ambient”.

If no action to manage off-road travel is taken, additional unauthorized routes can develop over time and there is high potential for repeated use as drivers notice previous routes taken by others. This use compacts and displaces soils and kills or injures vegetation, which results in habitat degredation and loss. While these effects are generally limited to the narrow route itself, habitat loss is a long-term effect.

Late-Successional Forest Associated Species

Not all areas of late-successional habitat are available for off-road travel. Such travel in LS habitats would be limited by legal restrictions (wilderness) or the heavy vegetation, steep terrain, and concentrations of downed wood common in these areas. Effects to late-successional species are evaluated by the amount of suitable habitat currently open to off-road vehicle travel. Of the 475,000 acres of late-successional habitats on the KNF, approximately 69,000 are available for motor vehicle use.

Direct effects due to disturbance include causing individuals to move or alter behavior. Late-successional species could be disturbed during the breeding or nesting season by cross-country travel. Disturbance could lead to reduced time on the den or nest, thereby threatening eggs, or young, with exposure. Disruption of foraging activities of nocturnal species is considered to be unlikely, since most vehicle use occurs during daylight hours. Use of routes near occupied owl and goshawk sites could affect reproductive functions.

A recent review and synthesis of the scientific information regarding noise disturbance and avian species completed by the USFWS indicates that the likelihood of noise-generating activities adversely affecting NSOs and marbled murrelets is a function of activity-generated noise levels relative to pre-project noise levels (USDI 2006). When project-generated noise levels reach or

exceed a threshold noise level above ambient noise level, an individual may respond with an adverse behavioral responses, physiological responses, or both. Research indicates that spotted owls may flush in response to noise generated within 200 feet, but almost never flush at longer distances (Delaney et al. 1997). Data also suggest that continued presentation of noise disturbance might cause birds to habituate to some types of noise. Research indicates that stress hormones increased in male northern spotted owls when they were located less than 0.25 mile from major logging roads (Wasser et al. 1997). Long-term effects from elevated stress hormones are unknown, but physical condition or reproductive success may be compromised (Marra and Holberton 1998, in Gaines et al. 2003). Delaney et al. (1999) corroborates the USFWS-recommended 400 meter zone around spotted owl nest sites as a reasonable distance for evaluating significant effects for noise disturbance activities. There are few data available to indicate how, or to what degree, other late-successional forest species are affected by noise disturbance, although anecdotal information suggests they are fairly tolerant of chronic (ongoing or ambient) noise and less tolerant of acute (sudden or unexpected) noise. Zielinski et. al (2007) found that OHV use does not affect marten distribution or habitat occupancy. There are no data on effects of vehicle noise on fisher (Zielinski, personal communication, 2010). Due to lack of data on other species, the 400 meter effects zone for noise disturbance used for NSO will be utilized for this group as a whole.

Marten and fisher could be affected by indirect impacts to prey populations (specifically squirrels). Squirrels could be affected by disturbance (resulting in lowered energy reserves available for the production of young), or changes in location or amount of food supplies due to soil compaction from vehicle use. However, no such effects have been reported to date, and the potential for this effect is considered to be limited by the generally low road density and by the small home range size of squirrels.

Indirect effects of unmanaged motorized use are associated with road and trail networks that could develop through time, removing or fragmenting habitat, isolating and decreasing the size of habitat patches, and increasing edge. This in turn could increase nest predation and parasitism rates by species such as jays or cowbirds (Miller et al. 1998), or provide increased access for generalist competitors or predators, such as coyotes (Buskirk and Ruggiero 1994). Species in this group could also be affected by loss of or changes in habitat conditions due to creation of new unauthorized routes, or displacement or avoidance due to continued physical disturbance or intrusion.

Cumulative effects are the combined direct and indirect effects of this project and those from ongoing or foreseeable projects that involve management of late-successional vegetation. The KNF LRMP was heavily influenced by the Northwest Forest Plan, which directed that management activities should protect and enhance late-successional habitats. The Forest-Wide LSR Assessment requires that activities such as timber harvest and fuels reduction be designed to

maintain late-successional habitat characteristics such as large trees and a canopy cover of 60% or more. Projects in late-successional habitats are therefore designed to have neutral or positive impacts on those habitats. Project design standards for activities that might affect NSOs and other late-successional species include a limited operating period; this is considered adequate to reduce or eliminate effects from noise and physical presence. Actual disturbance from noise or human presence in management units is generally very short term in nature (5-10 days during a single summer). Effects from foreseeable projects overlap with Travel Management through changes to habitat (caused by road construction or decommissioning) or continued disturbance from newly constructed roads, both of which can be long term in nature. This analysis focuses on the cumulative effects of this project and any roads or trails proposed in ongoing or foreseeable management projects (Appendix B).

NSO Critical Habitat

Critical Habitat (CH) for northern spotted owls was designated in 1992 and was modified in September 2008 (USDI Fish and Wildlife Service 2008a). The distribution and total acres of the 2008 subunits differ somewhat from the 1992 NSO critical habitat designation, and the 2008 maps are still being finalized. Therefore, the analysis of potential effects to CH considered both versions. The Biological Assessment determined that there would be no loss or degradation of critical habitat from this project, and therefore No Effect on critical habitat. Consultation with Fish and Wildlife Service confirmed this determination; critical habitat is not addressed further in this document. See the BA in the project files for more information on the determination for critical habitat.

Marbled Murrelet Critical Habitat

Critical Habitat (CH) for marbled murrelets was designated in 1996 and was proposed for modification in July 2008. The Biological Assessment determined that there would be no loss or degradation of critical habitat from this project, and therefore No Effect on critical habitat. Consultation with Fish and Wildlife Service confirmed this determination; critical habitat is not addressed further in this document. See the BA in the project files for more information on the determination for critical habitat.

Environmental Consequences

Alternative 1

Direct and indirect effects of the prohibition of cross-country motorized vehicle travel

This alternative does not prohibit cross-country motorized travel. Included in cross-country travel are the effects from continuation of use on unauthorized routes. Disturbance from motor

vehicles can lead to physiological responses such as increased stress hormones (Wasser et al. 1997 as reported in Gaines et al. 2003).

Effects to late-successional habitats could occur on any of the 69,000 acres of LS habitats currently available for off-road travel. This acreage represents 14% of total suitable NSO habitat on the KNF, 18% (25,700 acres) of marten habitat, and 17% (12,000 acres) of murrelet habitat. Direct effects would include habitat degradation through crushing or killing of plants, and noise disturbance, which could occur on any of the acres available to cross country travel.

The primary direct effect to individuals would be disturbance from human noise or intrusion. Existing routes indicate repeated vehicle use so there is a higher expectation that vehicle noise would occur along the 156 miles of unauthorized routes currently within or adjacent to late-successional habitats. Two miles occur within 0.25 mile of six known NSO sites, and 9 miles are within 0.25 mile of 9 known goshawk sites (Table TW-3). These sites have a higher potential to be negatively affected by noise and physical intrusion of motorized vehicles.

Indirect effects include long-term loss of habitat through compaction of soil and changes to or loss of vegetation. Over 300 acres of late-successional habitat would remain disturbed and the opportunity for recovery would be foregone in the long term.

Table TW-3. Alternative 1: Miles of routes within 0.25 mile of suitable habitat or known sites

Late-successional Species	Miles of unauthorized routes within or within 0.25 mile of LS habitat	Number of sensitive sites within 0.25 mile of added route
NSO/Fisher/Goshawk	156	6/NA*/9
Marten Habitat	16	N/A*
Marbled Murrelet Habitat	5	0

*There are no known fisher or marten denning sites identified on the KNF.

Vehicle use low and dispersed across the KNF. Most vehicle traffic occurs in the late spring through the fall; use from about November through April is often limited by snow and wet conditions, especially at the higher elevations where marten habitat occurs. Routes closest to established sensitive sites would have the highest potential for disturbing reproductive activities, although any site accessible to off-road travel could be affected. About 14% of LS habitats could be subjected to noise associated with unauthorized routes. With these limitations, some impacts to LS species and habitats may occur but effects are not expected to be substantial. For the LS group, the use of unauthorized routes is unlikely to contribute to direct mortality or generate sufficient disturbance to affect population parameters such as fecundity or mortality rates.

Direct and indirect effects of adding facilities to the NFTS

No additions to the NFTS are proposed.

Cumulative effects

Cumulative effects include the impacts from continued cross-country travel and vehicle use on 156 miles of unauthorized routes in LS habitats added to the effects from ongoing and foreseeable road-related activities (Appendix B). The Goosenest Late-Successional Reserve Habitat Restoration Project will add three miles along six road segments in LS habitats. The project analyzed impacts to LS habitats and species and determined that there would be a short-term adverse impact to some species, but long-term benefits to late-successional habitats. There will be long-term benefits from decommissioning 16 miles of NFTS roads on the west side of the Forest in LS habitats; vehicle disturbance will be removed from these routes, and they will slowly revegetate.

Alternative 1, together with the ongoing and foreseeable road-related activities has the potential for habitat removal or degradation from route proliferation on over 69,000 acres of LS habitats. Vehicle disturbance on open areas and routes would continue; however, foreseeable road-related actions would provide some long-term benefits.

Alternative 2

Direct and indirect effects of the prohibition of cross-country motorized travel

The prohibition of cross-country motorized travel would reduce or eliminate noise and disruption from vehicles on 69,000 acres of late-successional habitats on the KNF. No additional routes would be created, eliminating the potential for degradation or loss of LS habitats. In the long-term, LS habitat within unauthorized routes that are not added to the NFTS would be expected to recover from soil and vegetation impacts caused by motorized use, although return of LS habitat characteristics would take more than 100 years. In both the short and long terms, focal species would not be affected by noise or physical disturbance on areas in or adjacent to LS habitats. This alternative is considered to be beneficial to both LS focal species and their habitats.

Direct and indirect effects of adding facilities to the NFTS

Of the 92 miles of roads and trails proposed in this alternative, about 30% (48 miles) lie within or adjacent to late-successional habitats (Table TW-4). Approximately 15,360 acres of LS habitat occur within 0.25 mile of these routes (about 3% of the LS habitat on the KNF). Less than 1 mile of routes lies within 0.25 mile of three NSO activity centers, and 2 miles lie within 0.25 mile of 3 goshawk sites. Approximately 15,360 acres of LS habitat occur within 0.25 mile of these routes (about 3% of the LS habitat on the KNF). No additional habitat will be removed, but designated routes (about 96 acres) will not revegetate and the potential for these acres to return to a late-successional condition will be foregone in the long term. Routes in marten and murrelet habitat (less than ½ mile) would not affect any known sites. Noise and physical disturbance will continue to occur along these routes. All routes proposed for addition to the NFTS are associated with

existing NFTS roads that generate vehicle noise, and the area of overlapping noise influence is substantial. Because unauthorized routes have been in place and used for many years, some level of vehicle noise is included in the ambient situation. Effects from vehicle noise are not expected to have a measurable impact on long-term population parameters.

This alternative proposes 65 acres in two open riding areas where cross-country travel would not be prohibited. These areas are not located in or adjacent to LS habitats.

Table TW-4. Alternative 2: Miles of routes within 0.25 mile of suitable habitat or known sites

Late-Successional Species	Miles of routes within or within 0.25 mile of LS habitat	Number of sensitive sites within 0.25 mile of added route
NSO/Fisher/Goshawk	48	3/NA*/3
Marten	0.4	NA*
Marbled Murrelet Zone 2	0.1	0

*There are no known fisher or marten denning sites identified on the KNF.

Cumulative effects

Cumulative effects include the combined effects from the prohibition on cross-country travel, the addition of 48 miles of routes in LS habitat, and the effects of ongoing and foreseeable road-related actions (Appendix B). Effects from the prohibition of cross-country motorized travel, which will remove vehicle use from 69,000 acres and 108 miles of routes in LS habitats, are considered to be entirely beneficial due to cessation of human disturbance, and the elimination of potential for new, user-created routes that could remove or degrade LS habitat. Ongoing and foreseeable actions will result in decommissioning of about 16 miles of NFTS roads in LS habitats, and the addition of 3 miles along 6 routes in the Goosenest Late-Successional Reserve Habitat Restoration Project. The Goosenest project analyzed impacts to LS habitats and species; there will be a short-term adverse impact, but long-term benefits to late-successional habitat.

Overall, there will be a total of about 51 miles of roads in LS habitats added to the NFTS, 16 miles decommissioned, and 108 miles where vehicle use will be eliminated, resulting in a net reduction of 73 miles of roads and routes in LS habitats. There will be long-term benefits from decommissioning roads and removing vehicle disturbance from these roads and routes, which will slowly revegetate over time.

Alternative 3

Direct and indirect effects of the prohibition of cross-country motorized travel

The effects of the prohibition on cross-country motorized travel are described under Alternative 2. Over time, vegetation would be expected to recover on 156 miles of routes in LS habitats. Noise and disturbance presently occurring on 69,000 acres of LS habitats, and within 0.25 mile of 3 NSO and 9 goshawk sites, would be eliminated.

Direct and indirect effects of adding facilities to the NFTS

No routes would be added to the NFTS under this alternative.

Cumulative effects

Cumulative effects include the combined effects from the prohibition on cross-country travel and the effects of ongoing and foreseeable road-related actions (Appendix B). Effects from the prohibition of cross-country motorized travel, which will remove vehicle use from 69,000 acres and 156 miles of routes in LS habitats, are considered to be entirely beneficial due to cessation of human disturbance, and the elimination of potential for new, user-created routes that could remove or degrade LS habitat. Ongoing and foreseeable actions will result in decommissioning of about 16 miles of NFTS roads in LS habitats, and the addition of 3 miles along 6 routes in the Goosenest Late-Successional Reserve Habitat Restoration Project. The Goosenest project analyzed impacts to LS habitats and species; there will be a short-term adverse impact, but long-term benefits to late-successional habitat.

Overall, there will be a total of 3 miles of roads in LS habitats added to the NFTS, and 168 miles removed through decommissioning or the prohibition of cross-country travel. There will be long term benefits from decommissioning roads and removing vehicle disturbance from 165 miles of routes in LS habitats. These roads and routes will slowly revegetate over time.

Alternative 4

Direct and indirect effects of the prohibition of cross-country motorized travel

The effects of prohibiting cross-country motorized travel are described under Alternative 2.

Direct and indirect effects of adding facilities to the NFTS

This alternative adds 0.4 mile of road within or adjacent to LS habitats to the NFTS. Approximately 128 acres of suitable habitat occur within 0.25 mile of these routes (an insignificant percentage of the total LS habitat on the KNF). There are no routes within 0.25 mile of known NSO sites, but there is 0.1 mile proposed within 0.25 mile of one known goshawk site (Table TW-5). No additional habitat will be impacted or removed; less than 1acre of LS habitat will not revegetate in the long term. The impacts from this alternative would be undetectable at the Forest scale.

Table TW-5. Alternative 4: Miles of routes within 0.25 mile of suitable habitat or known sites

Late-Successional Species	Miles of routes within or within 0.25 mile of LS habitat	Number of sensitive sites within 0.25 mile of added route
NSO/Fisher/Goshawk	0.4	0/NA*/1
Marten	0.2	NA*
Marbled Murrelet Zone 2	0	0

*There are no known fisher or marten denning sites on the KNF

Cumulative effects

Cumulative effects include the combined effects from the prohibition on cross-country travel and the effects of ongoing and foreseeable road-related actions (Appendix B). Effects from the prohibition of cross-country motorized travel, which will remove vehicle use from 69,000 acres and 156 miles of routes in LS habitats, are considered to be entirely beneficial due to cessation of human disturbance, and the elimination of potential for new, user-created routes that could remove or degrade LS habitat. Ongoing and foreseeable actions will result in decommissioning of about 16 miles of NFTS roads in LS habitats, and the addition of 3 miles along 6 routes in the Goosenest Late-Successional Reserve Habitat Restoration Project. The Goosenest project analyzed impacts to LS habitats and species; there will be a short-term adverse impact, but long-term benefits to late-successional habitat.

There will be a total of 3.4 miles of roads in LS habitats added to the NFTS, and about 167.6 miles removed through decommissioning or the prohibition of cross-country travel. There will be long term benefits from decommissioning roads and removing vehicle disturbance from 164 miles of routes in LS habitats. These roads and routes will slowly revegetate over time.

Alternative 5

Direct and indirect effects of the prohibition of cross-country motorized travel

The effects of prohibiting cross-country motorized travel are described under Alternative 2.

Direct and indirect effects of adding facilities to the NFTS

Of the 69 miles of roads and trails proposed in this alternative, 38 miles lie within or adjacent to late-successional habitats (Table TW-6). Approximately 12,160 acres of LS habitat occur within 0.25 mile of these routes (about 2.6% of the LS habitat on the KNF). Less than 1 mile lies within 0.25 mile of three NSO activity centers, and 2 miles lie within 0.25 mile of 3 goshawk sites. About 0.1 mile lies within marbled murrelet (Zone 2) habitat. No additional habitat will be removed, but designated routes (comprising about 81 acres) will not revegetate in the long term.

Noise and physical disturbance will continue to occur along routes added to the NFTS. All routes proposed for addition to the NFTS are associated with existing NFTS roads that generate

vehicle noise, and the area of overlapping noise influence is substantial. Effects from vehicle noise are not expected to have a measurable impact on long-term population parameters.

This alternative proposes 53 acres in two open riding areas where cross-country travel would not be prohibited. These areas are not located in or adjacent to LS habitats.

Table TW-6. Alternative 5: Miles of routes within 0.25 mile of suitable habitat or known sites

Late-Successional Species	Miles of routes within or within 0.25 mile of LS habitat	Number of sensitive sites within 0.25 mile of added route
NSO/Fisher/Goshawk	38	3/NA*/3
Marten	15	0
Marbled Murrelet Zone 2	0.1	NA*

*There are no known fisher or marten denning sites identified on the KNF.

Cumulative effects

Cumulative effects include the combined effects from the prohibition on cross-country travel, the addition of 38 miles of routes in LS habitat, and the effects of ongoing and foreseeable road-related actions. Effects from the prohibition of cross-country motorized travel, which will remove vehicle use from 69,000 acres and 118 miles of routes in LS habitats, are considered to be entirely beneficial due to cessation of human disturbance, and the elimination of potential for new, user-created routes that could remove or degrade LS habitat. Ongoing and foreseeable actions will result in decommissioning of about 16 miles of NFTS roads in LS habitats, and the addition of 3 miles along 6 routes in the Goosenest Late-Successional Reserve Habitat Restoration Project. The Goosenest project analyzed impacts to LS habitats and species; there will be a short-term adverse impact, but long-term benefits to late-successional habitat.

There will be a total of about 41 miles of roads in LS habitats added to the NFTS, 16 miles decommissioned, and 118 miles where vehicle use will be eliminated resulting in a net reduction of 93 miles of routes in LS habitats. There will be long-term benefits from decommissioning roads and removing vehicle disturbance from these routes and roads, which will slowly revegetate over time.

Alternative 6

Direct and indirect effects of the prohibition of cross-country motorized travel

The effects of prohibiting cross-country motorized travel are described under Alternative 2.

Direct and indirect effects of adding facilities to the NFTS

Of the 59 miles of roads and trails proposed in this alternative, 32 miles lie within or adjacent to late-successional habitats (Table TW-7). Approximately 10,240 acres of LS habitat occur within 0.25 mile of these routes (about 2% of the LS habitat on the KNF). Approximately 0.6 mile of

proposed routes occurs within 0.25 mile of three NSO activity centers, and 2 miles lie within 0.25 mile of 3 goshawk sites. About 0.04 mile lies within marbled murrelet (Zone 2) habitat. No additional habitat will be removed, but designated routes (comprising about 69 acres) will not revegetate in the long term.

Noise and physical disturbance will continue to occur along routes added to the NFTS. All routes proposed for addition to the NFTS are associated with existing NFTS roads that generate vehicle noise, and the area of overlapping noise influence is substantial. Because unauthorized routes have been in place and used for many years, some level of vehicle noise is included in the ambient situation. Effects from vehicle noise are not expected to have a measurable impact on long-term population parameters.

This alternative proposes to add two designated open riding areas (53 acres total) where cross-country travel would not be prohibited. These areas are not located in or adjacent to late-successional habitat; therefore, no effects are expected.

Table TW-7. Alternative 6: Miles of routes within 0.25 mile of suitable habitat or known sites

Late-Successional Species	Miles of routes within or within 0.25 mile of LS habitat	Number of sensitive sites within 0.25 mile of added route
NSO/Fisher/Goshawk	32	3/NA*/3
Marten	12	0
Marbled Murrelet Zone 2	0.04	0

*There are no known fisher denning sites identified on the KNF.

Cumulative Effects

Cumulative effects include the combined effects from the prohibition on cross-country travel, the addition of 32 miles of routes in LS habitat, and the effects of ongoing and foreseeable road-related actions. Effects from the prohibition of cross-country motorized travel, which will remove vehicle use from 69,000 acres and 124 miles of routes in LS habitats, are considered to be entirely beneficial due to cessation of human disturbance, and the elimination of potential for creation of new unauthorized routes that could remove or degrade LS habitat. Ongoing and foreseeable actions will result in decommissioning of about 16 miles of NFTS roads in LS habitats, and the addition of 3 miles along 6 routes in the Goosenest Late-Successional Reserve Habitat Restoration Project. The Goosenest project analyzed impacts to LS habitats and species; there will be a short-term adverse impact, but long-term benefits to late-successional habitat.

There will be about 35 miles of roads in LS habitats added to the NFTS, 16 miles decommissioned, and 124 miles where vehicle use will be eliminated, resulting in a net reduction of 105 miles of routes in LS habitats. There will be long-term benefits from decommissioning roads and removing vehicle disturbance from these routes and roads, which will slowly revegetate over time.

Alternative 7

This alternative is identical to Alternative 5 for routes within late-successional habitats. Direct, indirect and cumulative effects under this alternative are identical to those discussed for Alternative 5.

Comparison of Effects on Late-Successional Species by Alternative

Alternative 1 would have the greatest effects on late-successional species, and Alternative 3 the least (Table TW-8). There is very little difference in effects between the other action alternatives; effects from Alternatives 5 and 7 are identical. The most significant effects are generated by the prohibition of off-road motorized travel; the benefits of this action overwhelm the effects of continued use of a small number of miles of unauthorized routes.

Table TW-8. Comparison of selected habitat change metrics by alternative for late-successional focal species (alternatives 5 and 7 are combined)

Species	Metric	Alt 1	Alt 2	Alt 3	Alt 4	Alt 5/7	Alt 6
NSO/ fisher / goshawk 475,000 acres of habitat	Acres of habitat available for cross-country travel /% of habitat	69,000 14%	0	0	0	0	0
	Miles of routes in habitat or within 0.25 mile of habitat	156	48	0	0.4	38	32
	Acres of habitat within 0.25 mi of proposed routes / % of KNF LS habitat	49,920 10.5%	15,360 3%	0	896 insig.	12,160 2.6%	10,240 2%
	Number of sensitive sites within 0.25 mile of added routes	6/NA*/9	3/NA*/0	0/0/0	0/NA*/1	3/NA*/0	3/NA*/0
American Marten Modeled habitat 144,500 acres	Acres of habitat available for cross-country travel/% of habitat	25,700 18%	0	0	0	0	0
	Miles of routes in habitat or within 0.25 mile of habitat	16	0.4	0	0.2	15	12
	Acres of habitat within 0.25 mi of proposed routes / % of KNF LS habitats	5,120 3.5%	128 <1%	0 0%	0.4 <1%	4,800 3%	3,840 2.6%
	Number of sensitive sites within 0.25 mile of added routes	NA*	NA*	NA*	NA*	NA*	NA*

Species	Metric	Alt 1	Alt 2	Alt 3	Alt 4	Alt 5/7	Alt 6
Marbled Murrelet Modeled habitat 71,300 acres	Acres of habitat available for cross-country travel / % of habitat	12,000 17%	0	0	0	0	0
	Miles of routes in habitat or within 0.25 mile of habitat	5	0.1	0	0	0.1	0.04
	Acres of habitat within 0.25 mi of proposed routes / % of KNF LS habitat	1,600 2.2%	0	0	0	32 insig.	13 insig.
	Number of sensitive sites within 0.25 mile of added routes	0	0	0	0	0	0

***There are no known fisher or marten denning sites identified on the KNF.**

Ungulate Group

Direct effects to animals such as injury or mortality may occur from collisions with vehicles on roads as well as direct and indirect effects to habitat. However, collisions with vehicles operating off road are rare and have not been reported to occur within the Forest. Collisions along NFTS roads have been documented on ML3, 4 and 5 roads where vehicle speeds are higher; no collisions on ML2 roads have been reported. This type of effect is considered to be highly unlikely.

Direct effects to habitat occur when vehicles crush browse plants and displace or compact soil, affecting soil productivity and thereby degrading habitat quality. Crushing could also indirectly lead to other changes in vegetation such as a reduction in development and growth of hiding cover for juveniles or adults, and the introduction of invasive species. This effect is expected to occur only under Alternative 1, as new routes could be created on the area open and available to cross-country travel.

The most likely impacts to ungulates, both in the short-term and the long term, would be the disturbance from vehicles or noise that would cause individuals to move or alter behavior. The most commonly described behavioral response to roads in the ungulate group includes displacement and avoidance where animals were reported as altering their use of feeding, breeding, or wintering habitats in response to motorized trails or trail networks. Many studies have documented increased use at greater distances from roads.

Unauthorized routes contribute to open road density (which serves as a proxy for disturbance effects). Densities of 3 miles per square mile or higher correlate with low habitat capability for deer (USDA 1995). Elk response to roads is not as linear; the amount of impact depends on traffic rates (use), proximity of cover adjacent to roads, and type of road. Overall, higher road densities contribute to lower elk habitat effectiveness (Rowland et al. 2005).

Human activities may be more significant to this group when occurring near areas where young are reared or on winter ranges (Canfield et al 1999, as cited in Gaines 2003; Phillips and Alldredge 2000 as reported in Gaines et al. 2003). Winter range is traditionally considered the limiting factor of environment; deer survive primarily by supplementing energy reserves accumulated prior to winter with energy intake from submaintenance winter diets (Mackie 1998). This requires behavior that emphasizes energy conservation; repeated movements away from roads or human-generated activities can deplete energy reserves that are already low. All routes considered for addition to the NFTS would be added as ML2 roads or motorized trails, which equate to a "primitive" rating; both Gaines and Benkobi (2004) suggest that primitive roads do not elicit a strong response from elk. This avoidance response is more pronounced in deer than elk.

The KNF supports about 220,000 acres of deer winter range identified by the California Department of Fish and Game. Unmanaged motor vehicle use is potentially a factor in the declining habitat conditions described by the Draft Siskiyou County Deer Management Plan (Siskiyou County Deer Working Group 2009); as routes proliferate, more habitat is available for vehicle use at all times of the year. The availability of seasonal ranges for year-round cross-country motorized travel is likely contributing to the state-wide declines in black-tailed deer population size, habitat and distribution (Schaefer, personal communication 2009). California Department of Fish and Game cites high road density as one factor contributing to declining conditions found in critical deer winter range.

The Humbug drainage is included in identified deer winter range and is an area of special concern because it supports an extensive road system, has a concentration of unauthorized routes, and receives higher motorized use than other parts of the KNF due to its proximity to Yreka and Interstate 5. It is also at a relatively low elevation and is accessible by vehicles for much of the winter and early spring. Due to these factors, the action alternatives all include a season of use (May 1 through October 31) on routes in the Humbug area proposed for addition to the NFTS. This will eliminate vehicle disturbance and noise from these routes during a critical time of the year for deer.

Environmental Consequences

Alternative 1

Direct and indirect effects of the prohibition on cross-country motorized travel

This alternative does not prohibit cross-country motorized travel. About 340,500 acres of seasonal elk habitats are available to cross-country travel (23%), and 160,000 acres of seasonal deer range are open (about 50%). All 497 miles of unauthorized routes occur in some type of seasonal ungulate range. Two areas of concentrated off-road use currently exist (Juniper Flat and

Humbug) that total about 60 acres. Juniper Flat is outside of key ranges; Humbug is located within deer winter range as identified by California Department of Fish and Game. Many of the disturbed sites in the Humbug concentrated use area will not recover in the short or long term regardless of whether they continue to receive vehicle use due to soil type and erosion hazard (see discussion under Soils section). Under this alternative, other concentrated use areas could develop in key elk or deer ranges without advance planning or mitigations.

Table TW-9 displays the number of acres of seasonal elk and deer habitats potentially available for cross-country vehicle travel under this alternative. About 45 percent of all elk seasonal habitat is exposed to off-road travel. About 50% of identified deer seasonal ranges are open to off-road use under this alternative. Vehicles could access any of these acres and disturb elk or deer.

Table TW-9. Alternative 1: Seasonal ungulate ranges that could be impacted by cross-country motorized travel

Species	Total acres of winter habitat on the KNF	Acres of winter habitat on KNF accessible to cross-country travel (% of total)	Total acres of summer fawning/calving habitat	Acres of summer habitat on KNF accessible to cross-country travel (% of total)
Elk	223,000	48,250 (22%)	1,467,000	340,570 (23%)
Deer	220,000	107,000 (47%)	108,400	59,900 (55%)

Unauthorized routes will continue to be used, and so will not have the opportunity to revegetate. There are 423 miles[13] of unauthorized routes in some type of ungulate seasonal range (Table TW-10), resulting in 846 acres of habitat that will not revegetate and are foregone in the short and long terms. No seasonal restrictions are in place for either the acres open to cross-country travel or the unauthorized routes, so the potential for disturbance to deer and elk during critical seasonal periods could be high.

Table TW-10. Alternative 1: Miles of routes within potential key habitat for the ungulate group

Species	Miles of Routes within Winter Range	Miles of Routes within Summer/Fawning Range
Elk	20	403
Black-Tailed Deer	112	66

Thirty-eight 7th field watersheds in elk seasonal ranges, 19 watersheds in deer winter range and 32 in deer summer range will continue to support road densities greater than 3 miles per square mile. Additional unauthorized routes could be created by off-road travel, which could increase open road densities in other watersheds that currently have open road densities supporting moderate or high habitat capability.

[13] Due to overlap of seasonal ranges, the total shown for elk includes the mileage within deer seasonal ranges.

Direct and indirect effects of adding facilities to the NFTS

This alternative does not propose additions to the NFTS.

Cumulative effects

Over the past decade, timber harvest on the KNF has declined sharply. Clearcut harvest strategies have been replaced by thinning and patch cuts, so that very little early successional habitat has been created. There has been some focus on shrub management on the Goosenest District, but this work has focused on enhancing existing habitats rather than creating new shrub-dominated sites. Fuels reduction activities (especially broadcast burning) could produce early seral conditions in some areas (including sprouting of browse species), which would be a positive impact on ungulate habitat. However, the LRMP directs that most sites be managed for late-successional habitats that may provide hiding and thermal cover, but provide limited forage.

Foreseeable management activities could create disturbances that would affect ungulates in seasonal ranges. Human intrusion and noise from heavy equipment is expected to occur in management units. This type of disturbance would occur over days or weeks in a single season, but would not be constant or long term in nature.

California Department of Fish and Game cites high road density as one factor contributing to declining conditions found in deer winter range. Road construction or decommissioning projects associated with management actions are considered to be the primary actions that overlap with effects from the Travel Management project.

Cumulative effects include the effects of the continued cross-country travel and vehicle use of 423 miles of unauthorized routes within ungulate seasonal ranges added to the effects from ongoing and foreseeable road-related activities. Within ungulate seasonal ranges, these activities include addition of 7.85 miles of ML 1 road and 7.72 miles of ML 2 road to the NFTS, and removal of 2.5 miles of ML 2 road by decommissioning. The ML1 roads are closed to vehicle use year-round and do not contribute to open road densities.

Road-related management activities will occur in 10 watersheds with high open road densities: Antelope Well, Buckhorn, Doggett, Garner Mountain, Grass Lake NE, Muskgrave, Pollic Flat, Tennant-Antelope Creek, Upper First, and Van Bremmer Well. Decommissioning activities in Buckhorn and Doggett will contribute toward a reduction in open road mileage; however, open road densities in all 10 watersheds will remain above 3 miles/mi^2 due to NFTS, county, state and private roads. These 10 watersheds will continue to provide low habitat capability for deer. Complete details of the cumulative effects analysis are included in the Ungulate Process Paper, included in the project files located in the Forest Supervisors Office in Yreka, California.

Alternative 2

Direct and indirect effects of the prohibition of cross-country motorized travel

This alternative prohibits cross-country motorized travel on 388,820 acres of seasonal elk range and 166,900 acres of seasonal deer range. Disturbance to animals, and disruption of fawning/calving activities would be eliminated on this acreage. The potential for creation of new unauthorized routes would be eliminated, so there would be no further loss or degradation of habitat beyond what has already occurred. About 339 miles (678 acres) of unauthorized routes in ungulate seasonal ranges that are not added to the NFTS will revegetate in the long term, although some routes in High and Very High EHRs in Humbug may take much longer to recover. Open road densities will decrease in all but three7th field watersheds (Table TW-11), resulting in some improvement to habitat capability for elk. Habitat capability for deer will improve from low to moderate in 14 watersheds within seasonal ranges. Some of the changes in open road density are very small and would probably have only localized benefits to ungulates.

Table TW-11. Open road densities (miles/mi2) in 7th field watersheds within ungulate seasonal ranges.

Watershed	Current	Alt 2	Alt 3	Alt 4	Alt 5	Alt 6	Alt 7
Antelope Sink	3.48	1.94	1.86	1.86	2.06	2.06	2.06
Antelope Well	3.00	2.89	1.96	1.96	1.97	1.97	1.97
Beaver-Grouse	3.54	3.32	3.32	3.32	3.32	3.32	3.32
Benjamin-Wingate	3.07	3.07	3.01	3.01	3.07	3.03	3.03
Buckhorn	4.68	4.43	4.34	4.34	4.38	4.37	4.38
Butte Ck Headwaters	3.02	2.96	2.96	2.96	2.96	2.96	2.96
Collins-Lime	4.06	4.05	4.05	4.05	4.06	4.06	4.06
Deadwood	5.66	5.63	5.60	5.60	5.63	5.60	5.61
Deer-Beaver	5.58	4.94	4.93	4.93	4.98	4.94	4.98
Dock Well	3.59	3.13	3.06	3.08	3.08	3.08	3.08
Doggett	5.96	5.83	5.82	5.82	5.83	5.83	5.83
East Fork Horse	3.40	3.40	3.36	3.36	3.40	3.36	3.36
Garner Mtn	3.85	3.00	2.82	2.82	2.86	2.84	2.86
Grass Lake NE	3.09	2.79	2.76	2.76	2.76	2.76	2.76
Grouse Hill	3.34	2.98	2.93	2.98	2.98	2.98	2.98
Haight Mtn	4.20	4.13	3.94	3.94	4.08	4.08	4.08
Hill 22	3.40	2.99	2.52	2.87	2.87	2.87	2.87
Hoop & Devil	3.11	3.11	3.08	3.08	3.11	3.11	3.11
Jaynes Canyon	4.92	4.87	4.84	4.84	4.88	4.87	4.88
Little Humbug	3.52	2.51	2.50	2.59	2.59	2.51	2.59

Watershed	Current	Alt 2	Alt 3	Alt 4	Alt 5	Alt 6	Alt 7
Long John	4.13	4.05	4.04	4.04	4.05	4.05	4.05
Lower First	4.92	2.84	2.47	2.47	2.47	2.47	2.47
Lower Horse	3.50	3.50	3.50	3.50	3.50	3.50	3.50
Main Horsethief	3.08	2.85	2.83	2.84	2.84	2.84	2.84
Middle Fork Humbug	4.59	3.12	2.21	2.42	2.83	2.83	2.80
Mud Lake	3.42	3.23	3.13	3.18	3.18	3.18	3.18
Muskgrave	3.28	2.70	2.65	2.65	2.70	2.70	2.70
Negro-Hotelling	3.28	3.28	3.27	3.27	3.28	3.28	3.28
Pollic Flat	3.09	2.74	2.68	2.74	2.74	2.74	2.74
Tamarack Flat	3.16	2.41	2.15	2.23	2.23	2.23	2.23
Tennant-Antelope Ck	4.31	3.77	3.53	3.57	3.57	3.57	3.85
Trapper Ck	3.88	3.64	3.60	3.64	3.64	3.64	3.64
Upper Antelope	3.09	3.06	3.01	3.01	3.07	3.06	3.07
Upper First	4.96	4.38	4.32	4.32	4.33	4.33	4.33
Upper Fish-Browns	3.07	3.00	2.99	2.99	3.07	3.00	3.07
Upper Humbug	5.58	3.63	2.65	2.65	4.02	3.81	3.90
Upper Shovel	3.57	2.89	2.87	2.87	2.87	2.87	2.87
Van Bremmer Well	4.62	3.00	2.77	2.77	2.99	2.99	2.99

Direct and indirect effects of adding facilities to the NFTS

This alternative proposes to add 92 miles of roads and motorized trails to the NFTS. All 92 miles are within elk seasonal ranges and 31 miles are in deer seasonal ranges (Table TW-12). About 184 acres habitat will not revegetate and is foregone in the short and long terms. Proposed routes are distributed across all six districts of the KNF, with the highest concentration of routes, and a 5-acre open riding area, proposed in the Humbug drainage in habitat designated by the California Department of Fish and Game as deer winter range. These routes are proposed as motorized trails, and along with the open riding area would have an annual season of use from May 1 to October 31. This season of use will keep vehicles out of the Rider, Kennebeck and Jakes Gulch drainages during the winter, which should eliminate disruption to wintering deer in these areas.

The Juniper Flat open riding area is not within seasonal ungulate range.

Table TW-12. Alternative 2: Miles of routes within potential key habitats for the ungulate group

Species	Miles of Routes within Winter Range	Miles of Routes within Summer/Fawning Range
Elk	8	84
Black-Tailed Deer	21	10

Cumulative effects

Cumulative effects include the effects of the continued cross-country travel and vehicle use of 331 miles of unauthorized routes within ungulate seasonal ranges added to the effects from ongoing and foreseeable road-related activities. Within ungulate seasonal ranges, these activities include addition of 7.85 miles of ML 1 road and 7.72 miles of ML 2 road to the NFTS, and removal of 2.5 miles of ML 2 road by decommissioning. The ML1 roads are closed to vehicle use year-round and do not contribute to open road densities.

Road-related management activities will occur in 10 watersheds with high open road densities: Antelope Well, Buckhorn, Doggett, Garner Mountain, Grass Lake NE, Muskgrave, Pollic Flat, Tennant-Antelope Creek, Upper First, and Van Bremmer Well. Decommissioning activities in Buckhorn and Doggett will contribute toward a reduction in open road mileage; however, open road densities in these watersheds, and in Garner Mountain, Tennant-Antelope, Upper First, and Van Bremmer Well, will remain above 3 miles/mi^2. Antelope Well, Grass Lake NE, Muskgrave, and Pollic Flat will have open road densities below 3 miles/mi^2 and provide moderate habitat capability for deer. Complete details of the cumulative effects analysis are included in the Ungulate Process Paper, included in the project files located in the Forest Supervisors Office in Yreka, California.

Alternative 3

Direct and indirect effects of the prohibition of cross-country motorized travel

This alternative prohibits cross-country motorized travel on 388,820 acres of seasonal elk range and 166,900 acres of seasonal deer range. Disturbance to animals, and disruption of fawning/calving activities would be eliminated on this acreage. The potential for creation of new unauthorized routes would be eliminated, so there would be no further loss or degradation of habitat beyond what has already occurred. About 423 miles (846 acres) of unauthorized routes in ungulate seasonal ranges that are not added to the NFTS will revegetate in the long term, although some routes in High and Very High EHRs in Humbug may take much longer to recover. Open road densities will decrease in all but one 7th field watershed (Table TW-11), resulting in some improvement to habitat capability for elk. Habitat capability for deer will improve from low to moderate in 18 watersheds within seasonal ranges. Some of the changes in open road density are very small and would probably have only localized benefits to ungulates.

Direct and indirect effects of adding facilities to the NFTS

No facilities would be added to the NFTS under this alternative.

Cumulative effects

Cumulative effects include the effects of the continued cross-country travel and vehicle use of 423 miles of unauthorized routes within ungulate seasonal ranges added to the effects from ongoing and foreseeable road-related activities. Within ungulate seasonal ranges, these activities include addition of 7.85 miles of ML 1 road and 7.72 miles of ML 2 road to the NFTS, and removal of 2.5 miles of ML 2 road by decommissioning. The ML1 roads are closed to vehicle use year-round and do not contribute to open road densities.

Road-related management activities will occur in 10 watersheds with high open road densities: Antelope Well, Buckhorn, Doggett, Garner Mountain, Grass Lake NE, Muskgrave, Pollic Flat, Tennant-Antelope Creek, Upper First, and Van Bremmer Well. Decommissioning activities in Buckhorn and Doggett will contribute toward a reduction in open road mileage; however, open road densities in these watersheds, and in Tennant-Antelope, Upper First, and Van Bremmer Well, will remain above 3 miles/mi^2. Antelope Well, Garner Mountain, Grass Lake NE, Muskgrave, and Pollic Flat will have open road densities below 3 miles/mi^2 and provide moderate habitat capability for deer. Complete details of the cumulative effects analysis are included in the Ungulate Process Paper, included in the project files located in the Forest Supervisors Office in Yreka, California.

Alternative 4

Direct and indirect effects of the prohibition of cross-country motorized travel

This alternative prohibits cross-country motorized travel on 388,820 acres of seasonal elk range and 166,900 acres of seasonal deer range. Disturbance to animals, and disruption of fawning/calving activities would be eliminated on this acreage. The potential for creation of new unauthorized routes would be eliminated, so there would be no further loss or degradation of habitat beyond what has already occurred. About 416 miles (832 acres) of unauthorized routes in ungulate seasonal ranges that are not added to the NFTS will revegetate in the long term, although some routes in High and Very High EHRs in Humbug may take much longer to recover. Open road densities will decrease in all but three7th field watersheds (Table TW-11), resulting in some improvement to habitat capability for elk. Habitat capability for deer will improve from low to moderate in 18 watersheds within seasonal ranges. Some of the changes in open road density are very small and would probably have only localized benefits to ungulates.

Direct and indirect effects of adding facilities to the NFTS

This alternative adds approximately 7 miles of roads and motorized trails to the NFTS, all of which are located within elk summer and transition ranges (Table TW-13). Less than one mile would be added as a motorized trail within deer winter range; that route would have a season of

use from May 1-October 31. This would prevent disturbance to wintering deer using the area. Changes in road densities in ungulate habitats are insignificant under this alternative.

Table TW-13. Alternative 4: Miles of routes within potential key habitats for the ungulate group

Species	Miles of Routes within Winter Range	Miles of Routes within Summer/Fawning Range
Elk	0	7
Black-Tailed Deer	0.7	0

Cumulative effects

Cumulative effects include the effects of the continued cross-country travel and vehicle use of 416 miles of unauthorized routes within ungulate seasonal ranges added to the effects from ongoing and foreseeable road-related activities. Within ungulate seasonal ranges, these activities include addition of 7.85 miles of ML 1 road and 7.72 miles of ML 2 road to the NFTS, and removal of 2.5 miles of ML 2 road by decommissioning. The ML1 roads are closed to vehicle use year-round and do not contribute to open road densities.

Road-related management activities will occur in 10 watersheds with high open road densities: Antelope Well, Buckhorn, Doggett, Garner Mountain, Grass Lake NE, Muskgrave, Pollic Flat, Tennant-Antelope Creek, Upper First, and Van Bremmer Well. Decommissioning activities in Buckhorn and Doggett will contribute toward a reduction in open road mileage; however, open road densities in these watersheds, and in Tennant-Antelope, Upper First, and Van Bremmer Well, will remain above 3 miles/mi^2. Antelope Well, Garner Mountain, Grass Lake NE, Muskgrave, and Pollic Flat will have open road densities below 3 miles/mi^2 and provide moderate habitat capability for deer. Complete details of the cumulative effects analysis are included in the Ungulate Process Paper, included in the project files located in the Forest Supervisors Office in Yreka, California.

Alternative 5

Direct and indirect effects of the prohibition of cross-country motorized travel

This alternative prohibits cross-country motorized travel on 388,820 acres of seasonal elk range and 166,900 acres of seasonal deer range. Disturbance to animals, and disruption of fawning/calving activities would be eliminated on this acreage. The potential for creation of new unauthorized routes would be eliminated, so there would be no further loss or degradation of habitat beyond what has already occurred. About 365 miles (730 acres) of unauthorized routes in ungulate seasonal ranges that are not added to the NFTS will revegetate in the long term, although some routes in High and Very High EHRs in Humbug may take much longer to recover. Open road densities will decrease in thirty 7th field watersheds and remain the same in 7 (Table TW-11), resulting in some improvement to habitat capability for elk. Habitat capability for deer

will improve from low to moderate in 16 watersheds within seasonal ranges. Some of the changes in open road density are very small and would probably have only localized benefits to ungulates.

Direct and indirect effects of adding facilities to the NFTS

This alternative proposes to add 69 miles of roads and motorized trails to the NFTS. About 58 miles are within elk seasonal ranges and 28 miles are in deer seasonal ranges (Table TW-14). About 116 acres habitat will not revegetate and are foregone in the short and long terms. Proposed routes are distributed across all six districts of the KNF, with the highest concentration of routes, and a 5-acre open riding area, proposed in the Humbug drainage in habitat designated by the California Department of Fish and Game as deer winter range. These routes are proposed as motorized trails, and along with the open riding area would have an annual season of use from May 1 to October 31. This season of use will keep vehicles out of the Rider, Kennebeck and Jakes Gulch drainages during the winter, which should eliminate disruption to wintering deer in these areas.

The Juniper Flat open riding area is not within seasonal ungulate range.

Table TW-14. Alternative 5: Miles of routes within seasonal habitats for the ungulate group

Species	Miles of Routes within Winter Range	Miles of Routes within Summer/Fawning Range
Elk	10	48
Black-Tailed Deer	21	7

Cumulative effects

Cumulative effects include the effects of the continued cross-country travel and vehicle use of 423 miles of unauthorized routes within ungulate seasonal ranges added to the effects from ongoing and foreseeable road-related activities. Within ungulate seasonal ranges, these activities include addition of 7.85 miles of ML 1 road and 7.72 miles of ML 2 road to the NFTS, and removal of 2.5 miles of ML 2 road by decommissioning. The ML1 roads are closed to vehicle use year-round and do not contribute to open road densities.

Road-related management activities will occur in 10 watersheds with high open road densities: Antelope Well, Buckhorn, Doggett, Garner Mountain, Grass Lake NE, Muskgrave, Pollic Flat, Tennant-Antelope Creek, Upper First, and Van Bremmer Well. Decommissioning activities in Buckhorn and Doggett will contribute toward a reduction in open road mileage; however, open road densities in these watersheds, and in Tennant-Antelope, Upper First, and Van Bremmer Well, will remain above 3 miles/mi^2. Antelope Well, Garner Mountain, Grass Lake NE, Muskgrave, and Pollic Flat will have open road densities below 3 miles/mi^2 and provide moderate

habitat capability for deer. Complete details of the cumulative effects analysis are included in the Ungulate Process Paper, included in the project files located in the Forest Supervisors Office in Yreka, California.

Alternative 6

Direct and indirect effects of the prohibition of cross-country motorized travel

This alternative prohibits cross-country motorized travel on 388,820 acres of seasonal elk range and 166,900 acres of seasonal deer range. Disturbance to animals, and disruption of fawning/calving activities would be eliminated on this acreage. The potential for creation of new unauthorized routes would be eliminated, so there would be no further loss or degradation of habitat beyond what has already occurred. About 364 miles (728 acres) of unauthorized routes in ungulate seasonal ranges that are not added to the NFTS will revegetate in the long term, although some routes in High and Very High EHRs in Humbug may take much longer to recover. Open road densities will decrease in thirty-three 7th field watersheds and remain the same in 4 (Table TW-15), resulting in some improvement to habitat capability for elk. Habitat capability for deer will improve from low to moderate in 16 watersheds within seasonal ranges. Some of the changes in open road density are very small and would probably have only localized benefits to ungulates.

Direct and indirect effects of adding facilities to the NFTS

This alternative proposes to add 59 miles of roads and motorized trails to the NFTS, all of which 59 are within elk seasonal ranges; 24 miles are within deer seasonal ranges (Table TW-XX). About 118 acres habitat will not revegetate and are foregone in the short and long terms. Proposed routes are distributed across all six districts of the KNF, with the highest concentration of routes, and a 5-acre open riding area, proposed in the Humbug drainage in habitat designated by the California Department of Fish and Game as deer winter range. These routes are proposed as motorized trails, and along with the open riding area would have an annual season of use from May 1 to October 31. This season of use will keep vehicles out of the Rider, Kennebeck and Jakes Gulch drainages during the winter, which should eliminate disruption to wintering deer in these areas.

The Juniper Flat open riding area is not within seasonal ungulate range.

Table TW-15. Alternative 6: Miles of routes within potential key habitats for the ungulate group

Species	Miles of Routes within Winter Range	Miles of Routes within Summer/Fawning Range
Elk	8	51
Black-Tailed Deer	19	5

Cumulative effects

Cumulative effects include the effects of the continued cross-country travel and vehicle use of 423 miles of unauthorized routes within ungulate seasonal ranges added to the effects from ongoing and foreseeable road-related activities. Within ungulate seasonal ranges, these activities include addition of 7.85 miles of ML 1 road and 7.72 miles of ML 2 road to the NFTS, and removal of 2.5 miles of ML 2 road by decommissioning. The ML1 roads are closed to vehicle use year-round and do not contribute to open road densities.

Road-related management activities will occur in 10 watersheds with high open road densities: Antelope Well, Buckhorn, Doggett, Garner Mountain, Grass Lake NE, Muskgrave, Pollic Flat, Tennant-Antelope Creek, Upper First, and Van Bremmer Well. Decommissioning activities in Buckhorn and Doggett will contribute toward a reduction in open road mileage; however, open road densities in these watersheds, and in Tennant-Antelope, Upper First, and Van Bremmer Well, will remain above 3 miles/mi^2. Antelope Well, Garner Mountain, Grass Lake NE, Muskgrave, and Pollic Flat will have open road densities below 3 miles/mi^2 and provide moderate habitat capability for deer. Complete details of the cumulative effects analysis are included in the Ungulate Process Paper, included in the project files located in the Forest Supervisors Office in Yreka, California.

Alternative 7

Direct and indirect effects of the prohibition of cross-country motorized travel

This alternative prohibits cross-country motorized travel on 388,820 acres of seasonal elk range and 166,900 acres of seasonal deer range. Disturbance to animals, and disruption of fawning/calving activities would be eliminated on this acreage. The potential for creation of new unauthorized routes would be eliminated, so there would be no further loss or degradation of habitat beyond what has already occurred. About 423 miles (846 acres) of unauthorized routes in ungulate seasonal ranges that are not added to the NFTS will revegetate in the long term, although some routes in High and Very High EHRs in Humbug may take much longer to recover. Open road densities will decrease in thirty-two 7th field watersheds and remain the same in 5 (Table TW-11), resulting in some improvement to habitat capability for elk. Habitat capability for deer will improve from low to moderate in 16 watersheds within seasonal ranges. Some of the changes in open road density are very small and would probably have only localized benefits to ungulates.

Direct and indirect effects of adding facilities to the NFTS

This alternative proposes to add 74 miles of roads and motorized trails to the NFTS. Fifty-eight miles are within elk seasonal ranges and 24 miles are within deer seasonal ranges (Table TW-16). About 116 acres of habitat will not revegetate and is foregone in the short and long terms.

Proposed routes are distributed across all six districts of the KNF, with the highest concentration of routes, and a 5-acre open riding area, proposed in the Humbug drainage in habitat designated by the California Department of Fish and Game as deer winter range. These routes are proposed as motorized trails, and along with the open riding area would have an annual season of use from May 1 to October 31. This season of use will keep vehicles out of the Rider, Kennebeck and Jakes Gulch drainages during the winter, which should eliminate disruption to wintering deer in these areas.

The Juniper Flat open riding area is not within seasonal ungulate range.

Table TW-16. Alternative 7: Miles of routes within potential key habitats for the ungulate group

Species	Miles of Routes within Winter Range	Miles of Routes within Summer/Fawning Range
Elk	8	50
Black-Tailed Deer	19	5

Cumulative effects

Cumulative effects include the effects of the continued cross-country travel and vehicle use of 423 miles of unauthorized routes within ungulate seasonal ranges added to the effects from ongoing and foreseeable road-related activities. Within ungulate seasonal ranges, these activities include addition of 7.85 miles of ML 1 road and 7.72 miles of ML 2 road to the NFTS, and removal of 2.5 miles of ML 2 road by decommissioning. The ML1 roads are closed to vehicle use year-round and do not contribute to open road densities.

Road-related management activities will occur in 10 watersheds with high open road densities: Antelope Well, Buckhorn, Doggett, Garner Mountain, Grass Lake NE, Muskgrave, Pollic Flat, Tennant-Antelope Creek, Upper First, and Van Bremmer Well. Decommissioning activities in Buckhorn and Doggett will contribute toward a reduction in open road mileage; however, open road densities in these watersheds, and in Tennant-Antelope, Upper First, and Van Bremmer Well, will remain above 3 miles/mi^2. Antelope Well, Garner Mountain, Grass Lake NE, Muskgrave, and Pollic Flat will have open road densities below 3 miles/mi^2 and provide moderate habitat capability for deer. Complete details of the cumulative effects analysis are included in the Ungulate Process Paper, included in the project files located in the Forest Supervisors Office in Yreka, California.

Summary of All Alternatives

Alternative 1 would have the greatest negative effects on ungulate species, due to unrestricted off-road travel in seasonal ranges, and Alternative 3 would show the greatest benefits. There are significant beneficial effects to the ungulate group from the prohibition of off-road travel,

including elimination of noise and vehicle disturbance from important winter range and fawning/calving areas. Road densities in all but one watershed with low habitat capability will decrease under all action alternatives. Seventeen watersheds in deer winter range will move from low to moderate habitat capability in Alternative 4, and 16 will move from low to moderate under alternatives 2, 5, 6 and 7. Reductions in open road mileage will reduce the potential for disturbance to animals on seasonal ranges and provide long term benefits for the ungulate group.

Table TW-17. Comparison of selected habitat change metrics by alternative for ungulate focal species

Species	Metric	Alt 1	Alt 2	Alt 3	Alt 4	Alt 5	Alt 6	Alt 7
Elk 1,690,000 acres seasonal habitat	Acres of habitat available for cross-country travel (% of habitat)	388,820 (23%)	5 (insig.)	0	0	5 (insig.)	5 (insig.)	5 (insig.)
	Miles of routes in seasonal habitats	423	92	0	7	58	59	58
Deer 328,000 acres seasonal habitat	Acres of habitat available for cross-country travel (% of habitat)	215,400 (50%)	5 (insig.)	0	0	5 (insig.)	5 (insig.)	5 (insig.)
	Miles of routes in seasonal habitats	178	31	0	0.7	28	24	24
Ungulates	# of watersheds with road density > 3 miles/mi^2	37	13	17	17	16	16	16

Riparian Group

Direct effects to riparian-dependent species could include impacts to individuals, negative behavioral responses, and loss in reproductive success from OHV noise and activities (Anthony et al. 1995, Buehler et al. 1991, Hamann et al. 1999, McGarigal et al. 1991, Watson 1993, in Gaines et al. 2007). Direct and indirect effects to riparian habitats include crushing or compaction of vegetation from vehicle use, or loss of vegetation from long term use of routes or through the introduction of invasive species. Breeding sites for the species addressed in this group are generally not known and use is often highly temporal and transitory; thus, potential effects are measured in terms of effects to habitat.

Off-road travel in meadow systems can have long-lasting effects. In a literature review, Ouren et al. 2007 describe the long-term effects of soil compaction before normal ecological processes can recover the soil's texture, even after a single vehicle pass. Use of wet meadows on

the KNF by OHVs can result in resource damage, and is therefore prohibited. However, cases of off-road use in meadows have been observed (Cheyne, Brown, personal communication, 2008).

Environmental Consequences

Approximately 67 miles of unauthorized routes occur within riparian reserves. Riparian areas are particularly vulnerable to motorized vehicle use because wet soils are more susceptible to compaction, and these habitats often attract high levels of human use (Gaines et al. 2003). Therefore, the likelihood of impacts is high where OHV use occurs in riparian zones. Ouren et al. (2007) notes that mortality rates among riparian-dependent species vary widely according to the habitat and route characteristics. Traffic density, speed, and availability of escape cover can all influence the occurrence and intensity of impacts from vehicle use.

Riparian-associated species primarily use the linear riparian zones, but some species utilize upland areas also. Western pond turtles, red-legged frogs, and willow flycatchers will use upland slopes or areas away from the water for feeding, breeding, or dispersing. It is difficult for an analysis at this scale to precisely quantify effects to suitable habitat for these species because of the microsite conditions found in occupied habitat.

Alternative 1

Direct and indirect effects of the prohibition on cross-country motorized travel

This alternative does not prohibit cross-country motorized travel. Under this alternative, 67 miles of unauthorized routes occur within riparian reserves, representing about three percent of total miles of stream habitat available Forestwide. Fourteen motorized stream crossings would continue to be used, and other low-water crossings could be created. The extent to which the riparian group could be affected in the long term cannot be quantitatively assessed because of the unknown potential for expansion of the user-created route system and the unknown distribution of these species on the KNF. Under the current management scenario, vehicle travel off designated NFS roads and the utilization of user-created routes would continue and routes likely would proliferate, leading to more habitat disturbance and loss. Currently disturbed areas would be subjected to continued use and would not recover. Table TW-18 displays the miles of routes within potential habitats for the riparian group.

About 0.15 mile of unauthorized routes occur within riparian habitats suitable for **willow flycatchers**. This low number is probably due to the difficulty of moving a vehicle through established willow stands. There is no documentation of willow flycatcher habitat loss due to off-highway vehicle use on the KNF. Should routes proliferate into these areas, vehicle use could directly influence reproductive success through displacement of adults or nest abandonment.

While there is no evidence of its occurrence to date, vehicle-induced changes to soil water levels could affect willow establishment and growth.

Riparian-dependent species such as the **western pond turtle**, **northern red-legged frog**, **tailed frog**, and **long-tailed vole** are small and not highly mobile, and are therefore more vulnerable to effects of OHV use in riparian vegetation or along streams. Home ranges for these species are small, so small areas of disturbance can have profound effects on individuals or their home ranges. Tailed frog and long-tailed vole are highly restricted to the zone immediately adjacent to the water and are highly vulnerable to the effects of vehicle use in riparian areas. The potential for effects from ongoing and future vehicle use in riparian areas is likely greater with these species than with any other wildlife group discussed in this document. About 9,270 acres of riparian habitats could be affected by cross country motorized travel. Approximately three miles of unauthorized routes occur in western pond turtle and northern red-legged frog habitat (less than 1 percent of the total habitat). Sandhill cranes, because of their mobility, would be less susceptible to small, localized impacts. The large-scale changes in wetland acreage and conditions that could affect cranes are unlikely to occur as a result of continued cross-country motorized travel on the KNF.

Implementation of this alternative could result in negative impacts to riparian areas through the short and long term. In the long term, 6 acres of riparian habitat and 134 acres of riparian reserves would continue to be impacted by vehicle use and would not recover. Noise and physical disturbance would continue to occur on 9,270 acres of riparian reserves. Intermittent stream channels are usually dry during summer months and are not likely to be occupied; crossing them with a motor vehicle at those times would not directly impact riparian habitats or species.

Table TW-18. Alternative 1: Miles of routes within potential habitat for the riparian group

Species	Habitat Forestwide[a]	Miles of Routes within Riparian Habitats / Miles within Riparian Reserves	Equivalent Acres of Routes within Riparian Reserves / % of Total RR Area[b]
Willow Flycatcher	3,236 ac	0.15 / 67	0.3 / insignificant
Western Pond Turtle	9,270 ac	3 / 67	6 / 0.2%
Northern Red-Legged Frog/Sandhill crane	9,270 ac	3 / 67	6 / 0.2%
Tailed Frog /LT Vole	2,500 miles[c]	3 / 67	6 / 0.2%

a - Habitat estimated by miles of perennial and intermittent streams.
b - Equivalent acres of miles in riparian reserves divided by Forestwide habitat.
C - All potential stream habitat is considered to be available habitat for these species.

Direct and indirect effects of adding facilities to the NFTS

This alternative does not add facilities to the NFTS.

Cumulative Effects

Cumulative effects include the impacts from continued cross-country travel and vehicle use on 67 miles of unauthorized routes in RRs added to the effects from ongoing and foreseeable management activities. Fuel reduction is the primary management activity taking place in riparian reserves. These projects generally include back burning or broadcast burning (little if any mechanical work is involved). While prescribed burning may take place in riparian reserves, it rarely affects riparian habitats since these habitats are generally moist and do not support fire. Fires may be allowed to back into riparian reserves, but they are extinguished if fire behavior increases and riparian vegetation is threatened. In addition, effects from fire are dissimilar to those occurring through establishment of unauthorized routes. Fire is a natural process that does not compact soil, and encourages resprouting of vegetation. No ongoing or foreseeable road construction projects are proposed within riparian reserves. Cumulative effects for this alternative are the same as those described under direct and indirect effects.

Alternative 2

Direct and indirect effects of the prohibition on cross-country motorized travel

The prohibition of cross-country travel would eliminate the potential for vehicle traffic on 9,270 acres within riparian habitats and on 23 miles of unauthorized routes within riparian reserves. These sites would recover and revegetate in the long term. Riparian-dependent species on 9,270 acres would not be disturbed by the presence or noise of vehicles. Any changes that result in reduced motorized access could be viewed as beneficial for these species. In the long-term, passive restoration would occur on 23 miles of routes within riparian reserves, and 4.4 acres of riparian habitat would be expected to recover from soil and vegetation impacts caused by unmanaged motorized travel. This alternative is considered to be beneficial to the establishment and maintenance of riparian habitats.

Direct and indirect effects of adding facilities to the NFTS

This alternative proposes adding 92 miles of roads and motorized trails to the NFTS, of which 23 miles are within riparian reserves. Of this total, about 0.8 mile (1.6 acre) is within mapped riparian vegetation. This alternative proposes to add 0.4 miles of routes within willow flycatcher habitat and 0.8 mile within red-legged frog, western pond turtle and sandhill crane habitat. No additional impacts to riparian habitats or species are expected to occur from adding these routes to the NFTS. Twenty-three miles (46 acres) of unauthorized routes in riparian reserves will continue to be used by vehicles and will not recover in the short or long term. This represents less than one percent of habitat on the KNF for tailed frog and long-tailed vole, pond turtle, red-legged frog, willow flycatcher, and sandhill crane habitat (Table TW-19).

Table TW-19. Alternative 2: Miles of routes within potential key habitat for the riparian group

Alternative 2	Miles of routes proposed within riparian habitats / Riparian reserves	Equivalent Acres in Riparian Habitats/ Riparian Reserves	Percent of Acres in Riparian Habitats / RRs Affected
Willow Flycatcher	0.05 / 0 .4	0.10 / 0.8	insignificant/ < 1%
Western Pond Turtle/ Sandhill crane	0.8 / 23	1.6 / 46	insignificant/ < 1%
Northern Red-Legged Frog	0.8 / 23	1.6 / 46	insignificant/ < 1%
Tailed Frog/LT Vole	23[a]	46[b]	1.2 % / < 1%

a - Total miles within riparian reserves proposed for addition to NFTS
b - Equivalent acres for miles of routes within riparian reserves

Alternative 2 also proposes 65 acres within two designated open riding areas where cross-country travel would not be prohibited. Juniper Flat open riding area is not located within a riparian reserve. The Humbug open riding area is partially within the boundaries of a riparian reserve, but does not support riparian vegetation. Vehicle use in these areas will not affect riparian habitats.

Cumulative Effects

No ongoing or foreseeable road-related activities affect riparian habitats. Cumulative effects for this alternative are the same as those described under direct and indirect effects.

Alternative 3

Direct and indirect effects of the prohibition on cross-country motorized travel

The prohibition of cross-country travel would eliminate the potential for vehicle traffic on 9,270 acres within riparian habitats and on 67 miles of unauthorized routes within riparian reserves. These sites would recover and revegetate in the long term. Riparian-dependent species on 9,270 acres would not be disturbed by the presence or noise of vehicles. Any changes that result in reduced motorized access could be viewed as beneficial for these species. In the long-term, passive restoration would occur on 67 miles of routes within riparian reserves, and 6 acres of riparian habitat would be expected to recover from soil and vegetation impacts caused by unmanaged motorized travel. This alternative is considered to be beneficial to the focal species within this group and to the establishment and maintenance of riparian habitats.

Direct and indirect effects of adding facilities to the NFTS

This alternative does not add facilities to the NFTS.

Cumulative effects

No ongoing or foreseeable road-related activities affect riparian habitats. Cumulative effects for this alternative are the same as those described under direct and indirect effects.

Alternative 4

Direct and indirect effects of the prohibition on cross-country motorized travel

The prohibition of cross-country travel would eliminate the potential for vehicle traffic on 9,270 acres within riparian habitats and on 67 miles of unauthorized routes within riparian reserves. These sites would recover and revegetate in the long term. Riparian-dependent species on 9,270 acres would not be disturbed by the presence or noise of vehicles. Any changes that result in reduced motorized access could be viewed as beneficial for these species. In the long-term, passive restoration would occur on 67 miles of routes within riparian reserves, and 6 acres of riparian habitat would be expected to recover from soil and vegetation impacts caused by unmanaged motorized travel. This alternative is considered to be beneficial to the focal species within this group and to the establishment and maintenance of riparian habitats.

Direct and indirect effects of adding facilities to the NFTS

Proposed routes do not occur in mapped riparian habitats, but 3 routes of routes (0.4 mile total) are proposed within riparian reserves. This equates to about 0.8 acre; effects to riparian species and habitats are not measurable and are discountable under this alternative. Table TW-20 displays the miles of proposed routes within potential habitat for the riparian group.

Table TW-20. Alternative 4: Miles of routes within potential habitat for the riparian group

Species	Miles of routes proposed within riparian habitats / Riparian reserves	Equivalent Acres in riparian habitats/ Riparian reserves	Percent of acres in riparian habitats / Riparian reserves
Willow Flycatcher	0 / 0	0.6 / 0.4	insignificant
Western Pond Turtle/ Sandhill Crane	0 / 0	0.6 / 0.4	insignificant
Northern Red-Legged Frog	0 / 0	0.6 / 0.4	insignificant
Tailed Frog / LT Vole	0 / 0	0.6 / 0.4	insignificant

Cumulative effects

No ongoing or foreseeable road-related activities affect riparian habitats. Cumulative effects for this alternative are the same as those described under direct and indirect effects.

Alternative 5

Direct and indirect effects of the prohibition of cross-country motorized travel

The prohibition of cross-country travel would eliminate the potential for vehicle traffic on 9,270 acres within riparian habitats and on 46 miles of unauthorized routes within riparian reserves. These sites would recover and revegetate in the long term. Riparian-dependent species on 9,270

acres would not be disturbed by the presence or noise of vehicles. Any changes that result in reduced motorized access could be viewed as beneficial for these species. In the long-term, passive restoration would occur on 46 miles of routes within riparian reserves, and about 4 acres of riparian habitat would be expected to recover from soil and vegetation impacts caused by unmanaged motorized travel. This alternative is considered to be beneficial to the focal species within this group and to the establishment and maintenance of riparian habitats.

Direct and indirect effects of adding facilities to the NFTS

This alternative proposes to add about 21 miles of routes within riparian reserves to the NFTS; less than one mile (2 acres) is within mapped riparian vegetation. This alternative proposes to add 0.4 mile of routes within willow flycatcher habitat and 0.8 mile of routes within red-legged frog and western pond turtle habitat, and 23 miles of routes within riparian reserves where tailed frogs and long-tailed voles could occur. No additional loss or degradation of habitat would be expected to occur.

Two acres of riparian habitat and 42 acres within riparian reserves will continue to be impacted by vehicle use, and will not recover in the long term (Table TW-21). This represents less than 1% of riparian reserve acres on the KNF and is considered to be an insignificant percentage of habitat for willow flycatcher, tailed frog, long-tailed vole, pond turtle, red-legged frog, and sandhill crane. No additional loss of habitat is expected under this alternative for any species in the riparian group.

Alternative 5 also proposes 53 acres within two designated open riding areas where cross-country travel would not be prohibited. Juniper Flat open riding area is not located within a riparian reserve. The Humbug open riding area is partially within the boundaries of a riparian reserve, but does not support riparian vegetation; vehicle use will not affect riparian habitats.

Table TW-21. Alternative 5: Miles of routes within potential key habitat for the riparian group

Species	Miles of routes proposed within riparian habitats / Riparian reserves	Equivalent Acres in riparian habitats/ Riparian reserves	Percent of acres in riparian habitats / Riparian reserves
Willow Flycatcher	0.05 / 21	0.10 / 42	Insignificant / < 1%
Western Pond Turtle/ Sandhill Crane	0.8 / 21	1.6 / 42	Insignificant / < 1%
Northern Red-Legged Frog	0.8 / 21	1.6 / 42	Insignificant / < 1%
Tailed Frog / LT Vole	21	42	0.25% / 0.5%

Cumulative Effects

No ongoing or foreseeable road-related activities affect riparian habitats. Cumulative effects for this alternative are the same as those described under direct and indirect effects.

Alternative 6

Direct and indirect effects of the prohibition on cross-country motorized travel

The prohibition of cross-country travel would eliminate the potential for vehicle traffic on 9,270 acres within riparian habitats and on about 49 miles of unauthorized routes within riparian reserves. These sites would recover and revegetate in the long term. Riparian-dependent species on 9,270 acres would not be disturbed by the presence or noise of vehicles. Any changes that result in reduced motorized access could be viewed as beneficial for these species. In the long-term, passive restoration would occur on 49 miles of routes within riparian reserves, and about 4.6 acres of riparian habitat would be expected to recover from soil and vegetation impacts caused by unmanaged motorized travel. This alternative is considered to be beneficial to the focal species within this group and to the establishment and maintenance of riparian habitats.

Direct and indirect effects of adding facilities to the NFTS

This alternative proposes to add 59 miles of roads and motorized trails to the NFTS, 18 miles within riparian reserves. About 0.7 mile is within mapped riparian vegetation. This alternative proposes to add 0.03 mile within willow flycatcher habitat, 0.7 mile within red-legged frog and western pond turtle habitat, and 21 miles within riparian reserves in potential habitats for tailed frogs and long-tailed voles. No additional loss or degradation of habitat would be expected to occur.

About 1.4 acres of riparian habitat and 42 acres within riparian reserves will continue to be impacted by vehicle use, and will not recover in the long term (Table TW-22). This represents less than 1% of riparian reserve acres on the KNF and is considered an insignificant percentage of habitat for willow flycatcher, tailed frog, long-tailed vole, pond turtle, red-legged frog, and sandhill crane. No additional loss of habitat is expected under this alternative for any species in the riparian group.

Alternative 6 also proposes 53 acres within two designated open riding areas where cross-country travel would not be prohibited. Juniper Flat open riding area is not located within a riparian reserve. The Humbug open riding area is partially within the boundaries of a riparian reserve, but does not support riparian vegetation. Vehicle use in these areas will not affect riparian habitats.

Table TW-22. Alternative 6: Miles of routes within potential key habitat for the riparian group

Species	Miles of routes proposed within riparian habitats / Riparian reserves	Equivalent Acres in riparian habitats/ Riparian reserves	Percent of acres in riparian habitats / Riparian reserves
Willow Flycatcher	0.05 / 26	0.10 / 26	Insignificant / < 1%
Western Pond Turtle/ Sandhill Crane	0.7 / 26	1.4 / 26	Insignificant / < 1%
Northern Red-Legged Frog	0.7 / 26	1.4 / 26	Insignificant / < 1%
Tailed Frog / LT Vole	26[a]	52[b]	0.25% / 0.5%

a - Total miles within riparian reserves proposed for addition to NFTS
b - Equivalent acres for miles of routes within riparian reserves

Cumulative effects

No ongoing or foreseeable road-related activities affect riparian habitats. Cumulative effects for this alternative are the same as those described under direct and indirect effects.

Alternative 7

Direct and indirect effects of the prohibition on cross-country motorized travel

The prohibition of cross-country travel would eliminate the potential for vehicle traffic on 9,270 acres within riparian habitats and on 47 miles of unauthorized routes within riparian reserves. These sites would recover and revegetate in the long term. Riparian-dependent species on 9,270 acres would not be disturbed by the presence or noise of vehicles. Any changes that result in reduced motorized access could be viewed as beneficial for these species. In the long-term, passive restoration would occur on 44.4 miles of routes within riparian reserves, and about 5 acres of riparian habitat would be expected to recover from soil and vegetation impacts caused by unmanaged motorized travel. This alternative is considered to be beneficial to the focal species within this group and to the establishment and maintenance of riparian habitats.

Direct and indirect effects of adding facilities to the NFTS

This alternative proposes to add 74 miles of roads and motorized trails to the NFTS, about 20 miles of which are within riparian reserves. Less than 0.5 mile (1 acre) is within mapped riparian vegetation. This alternative proposes to add 0.2 mile within willow flycatcher habitat and 0.6 mile within red-legged frog and western pond turtle habitat, and 20 miles within riparian reserves where tailed frogs and long-tailed voles could occur. No additional loss or degradation of habitat would be expected to occur.

One acre of riparian habitat and 40 acres within riparian reserves will continue to be impacted by vehicle use, and will not recover in the long term (Table TW-23). This represents less than 1%

of riparian reserve acres on the KNF, and is considered an insignificant percentage of habitat for willow flycatcher, tailed frog, long-tailed vole, pond turtle, red-legged frog, and sandhill crane. No additional loss of habitat is expected under this alternative for any species in the riparian group.

Alternative 7 also proposes 53 acres within two designated open riding areas where cross-country travel would not be prohibited. Juniper Flat open riding area is not located within a riparian reserve. The Humbug open riding area is partially within the boundaries of a riparian reserve, but does not support riparian vegetation; vehicle use will not affect riparian habitats.

Table TW-23. Alternative 7: Miles of routes within potential key habitat for the riparian group

Species	Miles of routes proposed within riparian habitats / Riparian reserves	Equivalent Acres in riparian habitats/ Riparian reserves	Percent of acres in riparian habitats / Riparian reserves
Willow Flycatcher	0.2 / 20.2	0.4 / 40	Insignificant / < 1%
Western Pond Turtle/ Sandhill Crane	0.6 / 20.2	1.2 / 40	Insignificant / < 1%
Northern Red-Legged Frog	0.6 / 20.2	1.2 / 40	Insignificant / < 1%
Tailed Frog / LT Vole	20.2	40	0.25% / 0.5%

Cumulative effects

No ongoing or foreseeable road-related activities affect riparian habitats. Cumulative effects for this alternative are the same as those described under direct and indirect effects.

Comparison of Effects on Riparian Species, by Alternative

Alternative 1 would have the greatest potential for negative effects to riparian habitats. Under this alternative, 9,270 acres of riparian habitats will continue to be at risk of impacts from cross-country vehicle travel, and additional habitat degradation and loss can occur (Table TW-24). The prohibition of cross-country travel included in all the action alternatives will eliminate these potential effects, providing substantial beneficial effects to riparian species. Alternative 3 would have the least effect and the greatest benefits. The small differences of expected effects between Alternatives 2, 5, 6 and 7 are essentially undetectable.

Table TW-24. Comparison of selected habitat change metrics by alternative for riparian focal species.

Species	Metric	Alt 1	Alt 2	Alt 3	Alt 4	Alt 5	Alt 6	Alt 7
	Miles of proposed routes within riparian reserves	67	23	0	0.4	21	18	20
	Equivalent acres of routes in RRs	134 ac	46 ac	0	0.8	42 ac	36 ac	40 ac
	Miles of proposed routes within riparian habitats	N/A	0.8	0	0	0.8	0.7	0.6
Willow Flycatcher Habitat 3,236 acres	Riparian habitat available open to cross-country motorized travel	3,236	0	0	0	0	0	0
	Miles of routes in mapped habitat / Acres	0.15 0.30	0.05 0.10	0 0	0 0	0.05 0.10	0.05 0.10	0.05 0.10
	% of habitat	Insig.	Insig.	0%	0%	Insig.	Insig.	Insig.
Northern Red-Legged Frog, Western Pond Turtle and Sandhill Crane Habitat 9,270 acres	Habitat available for cross-country travel	9,270	0	0	0	0	0	0
	Miles of routes in mapped habitat / Acres	3	0.8	0	0	0.8	0.7	0.6
	% of habitat	Insig.	Insig.	0%	0%	Insig.	Insig.	Insig.
Potential Tailed Frog and Long Tailed Vole Habitat (perennial and intermittent streams)	Habitat available for cross-country travel	1,800 mi of streams	0	0	0	0	0	0
	Miles of unauthorized routes or proposed routes in habitat	67	23	0	0.4	21	18	20
	Percent of KNF potential habitat	7%	1%	0%	Insig.	1%	1%	1%

***Insignificant = less than 0.001%**

Cavity Dependent Species

Species in this group could be affected by a variety of road and trail-associated factors, although direct effects to animals such as collisions are considered highly unlikely. This analysis focuses on loss or degradation of habitat, and indirect effects such as avoidance or displacement due to disturbance from motor vehicles or noise.

Snag numbers increase as a result of wildfire, drought and insect infestation. There has been extensive wildfire activity on the KNF in the last decade, with over 200,000 acres burned in 2008 alone. Drought in the early 1990s and 2000s killed numerous trees (especially smaller size trees),

and continues to play a role in distribution of woody vegetation across the KNF. Insect activity is increasing across the KNF (Blessing, personal communication 2009); a large area in the Shovel Creek Meadow area of the Goosenest Ranger District has suffered significant tree mortality, and the number of snags at higher elevations on that district is increasing dramatically. Snag numbers across the KNF are high in portions or all of most 7th field watersheds, and in many areas they are significantly in excess of the number required in the LRMP.

Environmental Consequences

Alternative 1

Direct and indirect effects of the prohibition on cross-country motorized travel

This alternative does not prohibit cross-country motorized travel. About 1.2 million acres, containing 630,000 acres considered habitat for cavity-dependent species, are available for motorized cross-country travel. About 24 percent of this habitat is open and available for cross-country motorized travel. Cross-country travel in this habitat type includes the use of 27 miles of unauthorized routes (54 acres), which is the equivalent of .008% of Forest habitat.

The most likely direct effect on cavity-dependent species is disturbance from vehicle noise or physical intrusion that would cause individuals to move or alter behavior, particularly during foraging activities. Vehicle proximity may cause birds to flush from feeding locations. Disturbance could also impact food deliveries to cavities, pair-bonding, and cavity construction. Breeding-related impacts are less likely to occur, as early breeding activities begin when snow impedes or prevents most cross-country travel. Pileated woodpeckers often forage near or on the ground (Bull and Jackson 1995) where they would be more susceptible to vehicle disturbance, but this species is more widespread on the west side of the KNF in steeper terrain that does not accommodate off-road use. Red-breasted sapsuckers are generalists commonly found in the widely distributed mid-mature mixed conifer stands found across the KNF, and would potentially be less susceptible due to their ability to use a variety of habitats. The pallid bat is sensitive to disturbance at roosting and breeding sites. It may be less vulnerable than others in this group to disturbance because it is not active during the day, when most vehicle traffic occurs.

Firewood cutters often take vehicles off roads to access down trees and snags. Currently, woodcutters can drive almost anywhere on the KNF, although woodcutting activity centers on NFTS roads and some unauthorized routes. Snags are highly targeted as a source of firewood, and can be cut under permit in some areas on the Forest. Continued off-road travel could result in the creation of new unauthorized routes that would expose more area to firewood harvest, potentially reducing the number of snags available for cavity-dependent species and affecting the number of future breeding and roosting sites. The highest potential for snag losses occurs on the Goosenest District where much of the land is accessible to off-road use because of the gentle terrain. White-

headed woodpeckers are common in the high elevation lodgepole and red fir communities, and are probably the species in this group most likely to be subjected to habitat modification due to preferential removal of lodgepole snags by woodcutters (Blessing, personal communication, 2008). Pallid bats are associated with large snags that are also targeted by woodcutters, so direct impacts to roost trees could occur. However, due to wildfire and insect activity that has occurred across the KNF over the last decade, snag levels are currently very high in many areas and will remain high for at least the next 20 years. Loss of snags to woodcutting along established routes will probably not represent a substantial loss of habitat for this group.

Direct and indirect effects of adding facilities to the NFTS

This alternative does not add facilities to the NFTS.

Cumulative effects

Cumulative effects include the impacts from continued cross-country travel and vehicle use on 27 miles of unauthorized routes added to the effects from ongoing and foreseeable road-related activities within snag habitat. There would be beneficial impacts from closure of 150,000 acres of snag habitat to human intrusion and disturbance. Road-related activities will add 13 miles of ML 1 and 26 miles of ML 2 roads to the NFTS, and decommission 50 miles of roads, all considered to be within habitat suitable for cavity-dependent species. ML1 roads are not open to public use and there should be no affect to snag numbers from woodcutting or hazard tree removal in the short or long term. Decommissioning roads would have positive long term beneficial effects as it eliminates the need to remove hazard trees from roadsides, and eliminates motorized access for woodcutters, so snags and dying trees would be left onsite. Removal of snags by woodcutters along an additional 20 miles of roads is not considered to be a significant impact to cavity-dependent species habitat due to the high numbers of snags that currently exist on the KNF due to recent wildfires, insect kills and drought.

Alternative 2

Direct and indirect effects of the prohibition on cross-country motorized travel

This alternative would eliminate the potential for creation of new unauthorized routes, along with vehicle and noise disturbance to cavity-dependent species, on 151,000 acres. Removing vehicle access on 405 miles of existing unauthorized routes would eliminate cutting of snags along these routes for firewood. While current levels of snags are high in many areas on the KNF, this could be a long term benefit to cavity-dependent focal species in those areas where snag numbers are limited, either due to vegetative type or the lack of recent wildfire or insect activity.

Direct and indirect effects of adding facilities to the NFTS

This alternative proposes to add 9 miles of roads and trails to the NFTS that occur in habitats used by the cavity-dependent group, which would affect 18 acres of habitat (an insignificant percentage of Forest habitat). NFTS roads are evaluated for hazard trees on a regular basis, and those that meet KNF hazard tree standards are removed. This could lead to a reduction in the number of snags or trees along these routes that could develop into snags. It is very likely that some woodcutting has already occurred on these routes, and that activity would likely continue. Through time, trees available for snag recruitment along these routes would decrease. However, the effects of adding these miles to the NFTS are considered to be insignificant given the quantity of habitat for cavity-dependent species Forestwide and the number of trees recently affected by insects and wildfire that will become snags in the next decade. Vehicle traffic on these routes has been occurring for some time and effects from noise or disturbance to any of the focal species in this group is considered to be minor.

Two open riding areas totaling 65 acres are proposed to be added to the NFTS; they do not contain habitat for cavity-dependent species.

Cumulative effects

Cumulative effects are the additive effects of this project and ongoing and foreseeable management activities. Vegetative management activities include project design features that retain snags consistent with LRMP standards. Road construction activities have the same type of impacts as this project (adding roads to the NFTS that will require removal of hazard trees and provide access to woodcutters). Therefore, road-related activities are included in this analysis.

Cumulative effects include the impacts from the prohibition of cross-country travel and vehicle use on 9 miles of unauthorized routes added to the effects from road-related activities within snag habitat. Road-related activities will add 10 miles of ML 1 and 20 miles of ML 2 roads to the NFTS, and decommission 30 miles of roads within habitat suitable for cavity-dependent species. ML1 roads are not open to public use and there should be no affect to snag numbers from woodcutting or hazard tree removal in the short or long term. Decommissioning roads would have positive long term beneficial effects as it eliminates the need to remove hazard trees from roadsides, and eliminates motorized access for woodcutters, so snags and dying trees would be left onsite. These activities will result in a net decrease of 1 mile of road in habitat suitable for cavity-dependent species. Snag numbers would potentially be affected within 30’ of added roads. These effects would be offset by the reduction in access for firewood cutters from 151,000 acres and 18 miles of unauthorized routes in snag habitat.

Alternative 3

Direct and indirect effects of the prohibition on cross-country motorized travel

Direct and indirect effects of the prohibition of cross-country travel are described under Alternative 2, except vehicle access would be removed from 497 miles of existing unauthorized routes. This alternative would be entirely beneficial for the focal species within this group.

Direct and indirect effects of adding facilities to the NFTS

This alternative does not add facilities to the NFTS.

Cumulative effects

Cumulative effects are the combination of the prohibition of cross-country travel with ongoing and foreseeable road-related activities. Road-related activities will add 10 miles of ML 1 and 20 miles of ML 2 roads to the NFTS, and decommission 30 miles of roads within habitat used by cavity-dependent species. Maintenance level 1 roads will not be open to the public and snag numbers should not be affected. These activities will result in a decrease of 10 miles of open road in habitat suitable for cavity-dependent species. In addition, access for firewood cutters will be eliminated from 151,000 acres and 27 miles of unauthorized routes in snag habitat.

Alternative 4

Direct and indirect effects of the prohibition on cross-country motorized travel

Direct and indirect effects of the prohibition of cross-country travel are described under Alternative 2, except vehicle access would be removed from 490 miles of existing unauthorized routes. This action would be entirely beneficial for the focal species within this group.

Direct and indirect effects of adding facilities to the NFTS

Alternative 4 would add about 0.2 mile to the NFTS within snag habitat, affecting less than 1 acre. The percentage of Forest habitat affected is insignificant and effects would not be measurable at any scale.

Cumulative effects

Cumulative effects are the combination of the prohibition of cross-country travel with ongoing and foreseeable road-related activities. Road-related activities will add 10 miles of ML 1 and 20 miles of ML 2 roads to the NFTS, and decommission 30 miles of roads within habitat used by cavity-dependent species. Maintenance level 1 roads will not be open to the public and snag numbers should not be affected. These activities will result in a net decrease of 10 miles of open road in habitat suitable for cavity-dependent species. In addition, access for firewood cutters will

be eliminated from 151,000 acres and 27 miles of unauthorized routes in snag habitat. Effects to cavity-dependent species are considered to be beneficial.

Alternative 5

Direct and indirect effects of the prohibition on cross-country motorized travel

Direct and indirect effects of the prohibition of cross-country travel are described under Alternative 2, except vehicle access would be removed from 428 miles of existing unauthorized routes. This action would be entirely beneficial for the focal species within this group.

Direct and indirect effects of adding facilities to the NFTS

This alternative proposes to add about 8.5 miles of routes within cavity-dependent species habitat, which would affect 17 acres of habitat (an insignificant percentage of Forest habitat). Effects are similar to those described in Alternative 2.

Two areas totaling 53 acres where cross-country travel would continue to occur are proposed to be added to the NFTS. Cavity-dependent species habitats do not occur in these sites.

Cumulative effects

Cumulative effects are the combination of the prohibition of cross-country travel with ongoing and foreseeable road-related activities. Road-related activities will add 10 miles of ML 1 and 20 miles of ML 2 roads to the NFTS, and decommission 30 miles of roads. Maintenance level 1 roads will not be open to the public and snag numbers should not be affected. These activities will result in a net decrease of 1.5 miles of open road in habitat suitable for cavity-dependent species. In addition, access for firewood cutters will be eliminated on 151,000 acres and 18.5 miles of unauthorized routes in snag habitat. Effects to cavity-dependent species are considered to be beneficial.

Alternative 6

Direct and indirect effects of the prohibition on cross-country motorized travel

Direct and indirect effects of the prohibition of cross-country travel are described under Alternative 2, except vehicle access would be removed from 438 miles of existing unauthorized routes. This action would be entirely beneficial for the focal species within this group.

Direct and indirect effects of adding facilities to the NFTS

This alternative would add 12 miles of roads and trails to the NFS that are in habitat for cavity-dependent species, which would affect 24 acres of habitat (an insignificant percentage of Forest habitat). Effects are similar to those described in Alternative 2.

Two areas totaling 53 acres where cross-country travel would continue to occur are proposed to be added to the NFTS. Cavity-dependent species habitats do not occur in these sites.

Cumulative effects

Cumulative effects are the combination of the prohibition of cross-country travel with ongoing and foreseeable road-related activities. Road-related activities will add 10 miles of ML 1 and 20 miles of ML 2 roads to the NFTS, and decommission 30 miles of roads. Maintenance level 1 roads will not be open to the public and snag numbers should not be affected. These activities will result in a net increase of 2 miles of road in habitat suitable for cavity-dependent species. In addition, access for firewood cutters will be eliminated from 151,000 acres and 15 miles of unauthorized routes in snag habitat. Effects to cavity-dependent species are considered to be beneficial.

Alternative 7

Direct and indirect effects of the prohibition on cross-country motorized travel

Direct and indirect effects of the prohibition of cross-country travel are described under Alternative 2, except vehicle access would be removed from 423 miles of existing unauthorized routes. This action would be entirely beneficial for the focal species within this group.

Direct and indirect effects of adding facilities to the NFTS

This alternative proposes to add about 8.5 miles of routes within cavity-dependent species' habitat, which would affect 17 acres of habitat (an insignificant percentage of Forest habitat). Effects are similar to those described in Alternative 2.

Two areas totaling 53 acres where cross-country travel would continue to occur are proposed to be added to the NFTS. Cavity-dependent species habitats do not occur in these sites.

Cumulative effects

Cumulative effects are the combination of the prohibition of cross-country travel with ongoing and foreseeable road-related activities. Road-related activities will add 10 miles of ML 1 and 20 miles of ML 2 roads to the NFTS, and decommission 30 miles of roads. Maintenance level 1 roads will not be open to the public and snag numbers should not be affected. These activities will result in a net decrease of 1.5 miles of open road in habitat suitable for cavity-dependent species. In addition, access for firewood cutters will be eliminated on 151,000 acres and 18.5 miles of unauthorized routes in snag habitat. Effects to cavity-dependent species are considered to be beneficial.

Comparison of Effects on Cavity-Dependent Species, by Alternative

The changes in mileages among action alternatives result in undetectable changes to habitats, and effects to snag-dependent species are not measurable. Overall, the effects from added routes are insignificant when taken in context of the 151,000 acres of habitat on the Forest.

Alternative 1 has the highest potential for negative effects, but these effects are limited in scope and intensity in comparison to other actions occurring on the landscape. The aggregate effects adding mileage to the road system are dispersed across the Forest and do not represent a significant proportion of Forestwide habitat. Other large-scale events (such as wildfire) have a much higher potential for effects on this habitat type. Beneficial effects to cavity-dependent species would occur on 69,000 acres (14 percent of Forestwide habitat) by prohibiting off-road use. All action alternatives would result in significant reductions in the number of acres accessible to woodcutters. Alternative 1 shows the most impacts to cavity-dependent species and Alternative 3 the least.

Table TW-25. Comparison of selected habitat change metrics by alternative for cavity-dependent focal species

Metric	Alt 1	Alt 2	Alt 3	Alt 4	Alt 5	Alt 6	Alt 7
Miles of Unauthorized Routes/Routes Proposed for Addition in Snag Habitats	27	9	0	0.2	8.5	12	8.5
Equivalent Acres Affected	45	18	0	0.4	17	24	17
Percentage of Forestwide Habitat	0.01	0.01	N/A	Insig.	Insig.	Insig.	Insig.

Hardwood and Grassland/Shrub-Steppe Groups

The discussion of potential effects to these two focal groups is combined because both habitat types are similarly affected by cross-country travel. The discussion of effects is combined for alternatives 2-6 because the magnitude of change among the alternatives was small and the expected effects were similar among the action alternatives. Alternative 7 is addressed separately for the grassland habitat type because it includes 14 miles of roads in grasslands and effects differ from the other alternatives.

Environmental Consequences

Direct and indirect effects to grassland/shrub-steppe and hardwood habitats include soil compaction from vehicle use, edge effects from route proliferation, and disturbance to individuals. Additional habitat degradation and loss can occur under Alternative 1. Impacts to individuals include direct mortality, displacement or avoidance, and disturbance from noise or

vehicle intrusion. Motorized use of unauthorized routes during the breeding season could result in decreased reproductive success such as nest abandonment or injury to young.

Alternative 1

Direct and indirect effects of the prohibition on cross-country motorized travel

This alternative does not prohibit cross-country travel.

Hardwoods: This alternative presents the highest route mileage and amount of habitat exposed to cross-country travel. Vehicle-caused mortality of western grey squirrels and acorn woodpeckers is not uncommon along highways, but is unlikely to occur from slower moving off-road vehicles. The vast majority of hardwood stands occur on the west side of the Forest where steep slopes limit cross-country travel, so direct impact to individuals in this group is likely very low. Disturbance to hardwood associated species' activities could occur along edges of unauthorized routes. Vehicle travel may disrupt foraging activities, resulting in increased energy expenditures. In the long term, continued cross-country motorized travel could result in route proliferation, resulting in less habitat available for foraging and reproduction. Approximately 9,200 acres, or 15 percent, of the total habitat on the Forest is estimated as accessible to off-road travel (Table TW-26).

Grassland/shrub-steppe: Cross-country vehicle use during the breeding season could result in injury or mortality to individuals, or decreased reproductive success such as nest abandonment or injury to young. All 10,600 acres of the grassland/shrub-steppe habitat is available to cross-country travel because of the gentle terrain, including 2,750 acres designated as pronghorn kidding area. Fourteen known Swainson's hawk nest sites and two of the historic burrowing owl colonies occur within 0.25 mile of unauthorized routes. LRMP standard and guideline 8-37 requires a restriction of activities within 0.25 mile of active Swainson's hawk nests during the breeding season (April 15 to August 15). Because the LRMP does not prohibit cross-country travel, there is currently no restriction on use of unauthorized routes on the BVNG, but productivity at these nests does not appear to have been affected (Cheyne, personal communication, 2009). This is perhaps because the birds have adapted to the regular vehicle use associated with these routes.

The highest risk of habitat degradation and/or disturbance to grassland/shrub-steppe habitat is from cross-country travel. Direct impacts to adult Swainson's hawks are unlikely to occur, but young in the nest can jump off nests if disturbed, potentially being run over or injured. Burrowing owl nest sites are not obvious to most people and are very vulnerable to destruction from vehicles traveling off-road. Young pronghorn remain motionless for long periods as part of ungulate "hider" strategy and can be run over by vehicles traveling cross-country. This is most likely to occur on the 2,750 acres of pronghorn kidding habitat.

With no controls or opportunities for mitigations, negative impacts to hardwood and grassland habitats would be expected to occur through the short and long term. In the long term, passive restoration of about 20 acres of hardwood habitat and 58 acres of grassland habitat would not occur due to continued vehicle use. Vehicle travel off designated NFS roads and on user-created routes would continue and routes would likely proliferate. Disturbance to individuals would continue to occur on 9,280 acres of hardwood habitat and 10,600 acres of grasslands. The actual extent to which these groups are affected as a result of implementing this alternative cannot be quantitatively assessed because of the unknown potential for expansion of the user created route system, and the timing and duration of the activities. With no controls or opportunities for mitigations, negative impacts to this group could continue to occur through the short and long term.

Table TW-26. Alternative 1: Miles and acres of routes within hardwood and grassland/shrub-steppe habitats.

Alternative 1	Total Habitat Forestwide	Acres of Habitat Open to Motorized Travel	Miles of Routes within Habitats	Equivalent Acres	Percent of Total Habitat[a]
Hardwoods	63,100	9,280	10	20	0.3%
Grassland/ shrub-steppe	10,600	10,600	29	58	0.5%

a - Percent of total habitat contained within identified unauthorized routes.

Direct and indirect effects of adding facilities to the NFTS

This alternative does not add facilities to the NFTS.

Cumulative effects

There are no management activities scheduled to occur in any grassland or hardwood habitats. Cumulative effects are identical to direct and indirect effects.

Alternatives 2 - 6

Direct and indirect effects of the prohibition on cross-country motorized travel

The action alternatives would significantly benefit the focal species within these groups and their habitat in the short and long term by eliminating the impacts caused by cross-country travel and use of unauthorized routes on the acres as described in Alternative 1. The focal species would not be affected by vehicular disturbance or noise from cross-country vehicle travel on the approximately 10,000 acres of these habitats currently available. No additional habitat would be impacted through creation of new unauthorized routes. Changes that reduce the potential for disturbance could be viewed as beneficial for these species. In the long-term, unauthorized routes

not added to the NFTS would be expected to passively recover from soil and vegetation impacts caused by motorized travel.

Direct and indirect effects of adding facilities to the NFTS

These alternatives propose adding 0-6 miles of roads to the NFTS in the grassland and hardwood habitat types. This would affect at most the equivalent of 8 acres of hardwood habitat, and 12 acres of grassland habitat.

One proposed route (8Q002.3) is within 100 meters of two Swainson's hawk nests. This route does not provide access to a recreation site, and receives only sporadic use. A seasonal restriction (April 15 - August 15) is proposed for this route, which will minimize disturbance to these nests during breeding season. All other proposed routes are outside of pronghorn habitats and are further than 0.25 mile of historic burrowing owl sites or Swainson's hawk nests. The impacts of adding roads and motorized trails to the NFTS in the grassland and hardwood habitats are considered to be imperceptible, and would not affect current trends in species population size, habitat or distribution for species in this group.

The action alternatives propose adding two designated open riding areas where cross-country travel would not be prohibited. These areas are not located within hardwood or grassland/shrub-steppe habitats and will not affect these species.

Cumulative effects

No management activities are scheduled to occur in any grassland or hardwood habitats. Cumulative effects are identical to direct and indirect effects.

Alternative 7

Direct and indirect effects of the prohibition on cross-country motorized travel

Effects are the same as those described for Alternatives 2-6 for both grassland and hardwood habitats.

Direct and indirect effects of adding facilities to the NFTS

This alternative is similar to Alternative 5, but proposes to add an additional 13 miles of roads (open to highway legal vehicles only) to the NFTS on the BVNG, which would affect 26 acres of grassland habitat. The proposed routes in the Butte Valley National Grassland were probably constructed in the 1930s and have been in place and used for many years. Some have gravel surfacing. One route is a published birding route and is used by the public for that purpose. These routes intersect 2 pronghorn kidding areas; approximately 190 acres of kidding habitat lie within 0.25 miles of the routes. Ten historic Swainson's hawk nest sites occur within 0.25 mile of these

routes, and three new nests were discovered in 2008. All the nests have repeated documented reproductive success (Cheyne, personal communication, 2009). The establishment of new nests and reproductive success indicates that hawks are completely habituated to the amount and type of vehicle traffic that has been occurring on these routes. Alternative 7 proposes to add these routes to the NFTS for highway legal vehicles only; this will mirror the type of vehicle use that historically has occurred. This alternative proposes a site-specific Forest Plan amendment that would exempt the 3 routes on the BVNG from LRMP standard 8-37 which requires a vehicle season of use for Swainson's hawk. While vehicle traffic will continue to generate noise, effects on nesting Swainson's hawks are considered to be minimal.

This alternative proposes the same routes in hardwood habitat as Alternative 5. Effects would be the same as for that alternative.

Cumulative effects

There are no management activities scheduled to occur in any grassland or hardwood habitats. Cumulative effects are identical to direct and indirect effects.

Comparison of Effects on Hardwood and Grassland Shrub-steppe Species, by Alternative

Alternative 1 would have the greatest potential for negative effects to hardwood and grassland habitats. Under this alternative, about 10,000 acres of each habitat type will continue to be at risk of impacts from cross-country vehicle travel, and additional habitat degradation and loss can occur. The prohibition of cross-country travel included in all the action alternatives will eliminate these potential effects, providing substantial beneficial effects to hardwood and grassland species. Alternatives 3 and 4 would have the least effect and the greatest benefits. There is little difference in effects between alternatives 2, 5, 6 and 7 for hardwood habitats. Of the action alternatives, Alternative 7 would have the greatest effects on grassland habitats.

Table TW-27. Comparison of selected habitat change metrics by alternative for hardwood and grassland/shrub-steppe focal species

Species	Metric	Alt 1	Alt 2	Alt 3	Alt 4	Alt 5	Alt 6	Alt 7
Hardwood Habitats (63,100 ac)	KNF habitat open to cross-country travel[a] Percent of Forest habitat	9,280 14%	0	0	0	0	0	0
	Miles of routes in habitat[a]	10	3	0	0	4	3	4
	Equivalent acres of routes in habitat (% of Forest habitat)	20 (0.03%)	6 (0.01%)	0	0	8 (0.01%)	6 (0.01%)	8 (0.01%)

Species	Metric	Alt 1	Alt 2	Alt 3	Alt 4	Alt 5	Alt 6	Alt 7
Grassland/ Shrub-Steppe Habitats (10,600 ac)	KNF habitat open to cross-country travel[a] Percent of Forest habitat	10,600 100%	0	0	0	0	0	0
	Miles of routes in habitat	29	4	0	0.4	6	4	19
	Equivalent acres of routes in habitat (% of Forest habitat)	58 (0.5%)	8 (0.07%)	0	0.8 (insig)	12 (0.1%)	8 (insig)	38 (0.3%)

a - Miles of unauthorized routes that could continue to receive motorized use under continued cross-country travel (Alt 1); miles of roads and motorized trails added to the NFTS and equivalent acres (all other alternatives)

Wide Ranging Carnivores

The black bear is identified as a special emphasis species that occurs throughout the Forest and utilizes a variety of habitats and seral stages. Bears den and rest in mature, dense forested sites that provide snags, stumps, uprooted trees, or large hollow tree cavities. Early successional vegetation communities provide a primary source of food for this omnivorous species. Effects to these late-successional habitats are discussed in the late-successional group as well as in the cavity-dependent species section.

The LRMP directs the Forest to manage open road densities to reduce the level of human interaction with bears during critical times of the year. The LRMP Black Bear Habitat Capability Model indicates that road densities exceeding 1.5 mile per square mile meets “low” capability. Most 7th field watersheds on the Forest outside of wilderness currently exceed this density due to the NFTS, private inholdings, and state and county roads. This project will not change road densities sufficient to affect habitat capability for black bears.

Cumulative effects are restricted to road-related activities because these typed of activities have effects similar to those expected to occur under this project. The discussion of effects is combined for alternatives 2, 5, 6 and 7, and alternatives 3 and 4 because the magnitude of change between the alternatives was small and the expected effects were similar.

Alternative 1

Direct and indirect effects of the prohibition on cross-country motorized travel

This alternative does not prohibit cross-country motorized travel.

Direct impacts of vehicles and bears are not common along highways, and are even more unlikely to occur as a result of slower moving off-road vehicles. Bears are more common on the west side of the Forest where topography is not as amenable to cross-country travel, so the

probability of direct impacts to bears is very low. Disturbance to foraging activities could occur along edges of unauthorized routes in both the short and long term. Cross-country travel could impact black bear food sources such as berries and invertebrates by crushing plants, displacing soil, or directly disturbing down logs or insect nests. Over time, if routes proliferate, habitat could be lost or degraded. Although black bears are known to habituate to sites with human presence (like large campgrounds), bears are generally wary and susceptible to noise disturbance on the KNF. This may be because of the remote nature of this Forest, and possibly due to hunting pressure.

About 612,000 acres of mature/late-successional habitats occur on the Forest in addition to 295,500 acres of early successional habitats that may be used by bears. Any of the effects noted above could continue to occur on these acres in both the short and long term.

Approximately 94 miles of routes (188 acres) occur within habitats for black bears; this comprises about 0.02 percent of the total available habitat. The area within the unauthorized routes has been subjected to soil compaction and loss of vegetation; these acres will not recover in the long term due to continued vehicle use. Without a prohibition on cross-country motorized travel, proliferation of routes in bear habitat could remove vegetation, leading to additional habitat loss or degradation. Due to steep topography, creation of numerous new unauthorized routes is not a serious threat.

Direct and indirect effects of adding facilities to the NFTS

This alternative does not add facilities to the NFTS.

Cumulative effects

Cumulative effects to black bears are the combined effects from the continued use of 94 miles of unauthorized routes and continued cross-country travel by motorized vehicles on up to 907,500 acres of habitat (much of which is inaccessible to vehicles) combined with ongoing and foreseeable management activities. Road-related activities will add 13 miles of ML 1 and 26 miles of ML 2 roads to the NFTS, and decommission 50 miles of roads. ML1 roads are closed to the public and not expected to affect bears. With the exception of a short (0.2 mile) spur, all ongoing and foreseeable roads are located on the Goosenest Ranger District, which contains relatively little bear habitat. Decommissioning 50 miles of road within bear habitats will return 100 acres to a productive state in the long term, and reduce disturbance associated with vehicle use on those roads. A net increase of 44 miles of roads in bear habitats would affect 88 acres.

Alternatives 3 and 4

Direct and indirect effects of the prohibition on cross-country motorized travel

These alternatives would benefit black bear habitat in both the short and long term by eliminating the effects of cross-country travel on 907,500 acres of black bear habitat. The potential for disturbance of individuals or impacts to food sources would be eliminated. A total of 497 miles (994 acres) of unauthorized routes will passively recover from soil and vegetation impacts caused by motorized travel. Closure of unauthorized routes would reduce road densities in all but one affected watershed on the KNF. While open road densities will decrease, most watersheds will remain above the 1.5 mile/mi^2 threshold required for moderate habitat capability. This action is considered to be entirely beneficial to black bears.

Direct and indirect effects of adding facilities to the NFTS

These alternatives propose adding 0-1 mile of motorized trail to the NFTS in early successional habitats (Table TW-28). This would affect at most 2 acres of habitat, an insignificant percentage of Forestwide black bear habitat.

Cumulative effects

Cumulative effects to black bears are the combined effects of the prohibition of cross-country motorized travel, addition of up to 1 mile of unauthorized routes to the NFTS in bear habitat, and the effects of ongoing and foreseeable management actions. Ongoing and foreseeable road-related activities include addition of 13 miles of ML 1 and 26 miles of ML 2 roads to the NFTS, and decommissioning of 50 miles of roads on the west side of the Forest in habitats suitable for bears. With the exception of a short (0.2 mile) spur, new roads are all located on the Goosenest Ranger District, which contains relatively little bear habitat. Decommissioning 50 miles of road within bear habitats will reduce disturbance associated with vehicle use; this is considered a beneficial effect. Effects of adding 1.2 miles to the NFTS are considered to be imperceptible and discountable due to the small amount of habitat affected. Any negative impacts that might occur under these alternatives are countered by the benefits of prohibiting cross-country motorized travel.

Alternatives 2, 5, 6, 7

Direct and indirect effects of the prohibition on cross-country motorized travel

These alternatives would benefit black bear habitat in both the short and long term by eliminating the effects of cross-country travel on 907,500 acres of black bear habitat. The potential for disturbance of individuals or impacts to food sources would be eliminated. About 469-471miles (934–938 acres) of unauthorized routes will passively recover from soil and vegetation impacts caused by motorized travel. This action is considered to be entirely beneficial to black bears.

Direct and indirect effects of adding facilities to the NFTS

These alternatives propose adding 25-28 miles of roads and motorized trails to the NFTS in early successional habitats (Table TW-28), totaling 50-56 acres of habitat. There is little difference in the scope of potential effects among alternatives 2, 4, 5, 6 and 7. At most, the addition of routes to the NFTS would represent less than 0.01 percent of the Forestwide habitat available to black bears, an insignificant percentage. The proposed routes are distributed across the Forest, many as very short spurs to access dispersed recreation sites. Closure of unauthorized routes would reduce road densities in all but one affected watershed on the KNF. While open road densities will decrease, most watersheds will remain above the 1.5 mile/mi^2 threshold required for moderate habitat capability.

Two open riding areas are proposed for addition to the NFTS; neither Humbug nor Juniper Flat is identified as key use areas for black bears. Suitable habitat does not occur in the Juniper Flat open riding area. Three acres of early successional habitat lie within the Humbug concentrated use area, which represents an insignificant proportion of black bear habitat.

Cumulative effects

Cumulative effects to black bears are the combined effects of the prohibition of cross-country motorized travel, and the effects of ongoing and foreseeable management actions. Ongoing and foreseeable road-related activities include addition of 13 miles of ML 1 and 26 miles of ML 2 roads to the NFTS, and decommissioning of 50 miles of roads on the west side of the Forest in habitats suitable for bears. With the exception of a short (0.2 mile) spur, new roads are all located on the Goosenest Ranger District, which contains relatively little bear habitat. Decommissioning 50 miles of road within bear habitats will reduce disturbance associated with vehicle use; this is considered a beneficial effect. The routes in the action alternatives are dispersed across the landscape and will not increase road densities in any 7th field watershed. Effects are considered to be imperceptible and discountable due to the small amount of habitat affected. Any negative impacts that might occur under these alternatives are countered by the benefits of prohibiting cross-country motorized travel.

Comparison of Effects on Wide-Ranging Carnivore Species, by Alternative

Alternative 1 would have the greatest potential for negative effects to habitats used by wide-ranging carnivores. Under this alternative, up to 907,500 acres of habitat would continue to be affected by cross-country vehicle travel, and additional habitat degradation and loss could occur from the creation of new unauthorized routes. The prohibition of cross-country travel included in all the action alternatives will eliminate these potential effects, providing substantial beneficial effects to carnivore species. Alternatives 3 and 4 would have the least effect and the greatest

benefits. The effects from Alternatives 5, 6 and 7 are identical, and very similar to those from Alternative 2.

Table TW-28. Comparison of selected habitat change metrics by alternative for wide-ranging carnivore focal species (black bear)

Species	Metric	Alt 1	Alt 2	Alt 3	Alt 4	Alt 5	Alt 6	Alt 7
Black Bear Habitat	Acres of habitat open to cross-country travel	907,500	0	0	0	0	0	0
	Miles of routes in habitat	94	28	0	1	26	26	25
	Equivalent acres of routes in habitat	188	56	0	2	52	52	50
	% of habitat on KNF	< 0.01	< 0.01	0	< 0.01	< 0.01	< 0.01	< 0.01

Compliance with the LRMP and Other Direction

Alternative 1 does not include mitigations that would protect wildlife species. Habitat could be lost in the future due to creation of new unauthorized routes which could kill or remove vegetation, or create disturbance that could negatively affect feeding or reproductive activities. New routes could lead to higher road densities.

The action alternatives reduce open road densities in all affected watersheds, and eliminate the potential for creation of new routes. Closure of some unauthorized routes and seasonal restrictions on other routes in deer winter range will reduce or eliminate vehicle disturbance from portions of the Humbug drainage. Alternatives 2, 3, 4, 5 and 6 comply with all applicable LRMP standards regarding wildlife. Alternative 7 proposes a Forest Plan amendment to allow year-round vehicle use of routes near Swainson's hawk nests in the Butte Valley National Grassland.

In accordance with the Endangered Species Act of 1973, as amended, a Biological Assessment/Biological Evaluation (BA/BE) was prepared by the project biologist. The BA/BE is incorporated by reference and may be found in the project files.

Summary of Determinations from the Biological Assessment/Biological Evaluation

The KNF Travel Management Biological Assessment/Biological Evaluation (BA/BE) included determinations for listed, candidate and sensitive wildlife species for alternatives 1-6. An Addendum to the BA/BE was prepared for Alternative 7. Determinations for all action alternatives were May Affect, Not Likely to Adversely Affect (with Beneficial Effects) due to the prohibition of cross-country motorized travel. A separate BA/BE was prepared addressing critical habitat for NSO and marbled murrelet; the determination is No Effect. Consultation with U.S.

Fish and Wildlife Service was completed on December 30, 2009. A summary of the consultation process is included in the project records. Determinations for threatened, candidate and sensitive wildlife species are summarized here:

Northern Spotted Owl: Alternative 1 may affect northern spotted owls but is not likely to adversely affect. There will be no effect to critical habitat. Alternatives 2-7 will have no effect on northern spotted owls or their critical habitat.

Marbled Murrelet: Alternative 1 may affect marbled murrelets but is not likely to adversely affect. Alternatives 2-7 will have no effect on marbled murrelets or their critical habitat.

Tidewater Goby: There will be no effect to Tidewater Goby or its critical habitat from alternatives 1-7.

Vernal Pool Fairy Shrimp: Alternative 1 may effect but is not likely to adversely affect. Alternatives 2-7 will have no effect on vernal pool fairy shrimp. There is no critical habitat for vernal pool fairy shrimp on the Forest; the proposed activities will not affect critical habitat.

Mardon Skipper: Alternative 1 may effect but is not likely to adversely affect; Alternatives 2-7 will have no effect on Mardon skipper.

American Marten: Alternatives 2-7 would not affect American marten or its habitat. Alternative 1 may affect individuals but is not likely to result in a trend toward Federal listing or loss of viability for the American marten.

Pacific Fisher: Alternative 1 may affect individuals but is not likely to result in a trend toward Federal listing or loss of viability for the fisher. Alternatives 2-7 would not affect the Pacific fisher.

Northern Goshawk: Alternative 1 may affect individual goshawks as cross-country travel could contribute disturbance or direct effects to foraging habitat, or breeding and reproductive activities. Alternatives 2-7 would not affect goshawks.

Great Grey Owl: Alternatives 2-7 would not affect the GGO. Alternative 1 may affect individuals but is not likely to result in a trend toward Federal listing or loss of viability.

Foothill Yellow-Legged Frog, Sandhill Crane, Willow Flycatcher, Western Pond Turtle: Alternatives 2-7 would not affect the above listed riparian-dependent species. Alternative 1 may affect individuals but is not likely to result in a trend toward Federal listing or loss of viability for the foothill yellow-legged frog, sandhill crane, willow flycatcher, and western pond turtle.

Swainson's Hawk: Alternatives 1-7 may affect individuals but are not likely to result in a trend toward Federal listing or loss of viability.

Pallid Bat: Alternatives 2-6 would not affect the pallid bat. Alternative 1 may affect individuals but is not likely to result in a trend toward Federal listing or loss of viability.

Management Indicator Species

Northern spotted owl, American marten, Pacific fisher, and **Northern goshawk** are addressed above.

Black Bear: Alternative 1 could negatively affect individuals through proliferation of routes over 907,500 acres of black bear habitat. Alternatives 2-7 would affect less than 0.01% of habitat. Eliminating cross-country motorized vehicle travel would have beneficial effects on bears.

Black-tailed deer: Alternative 1 could negatively affect individuals through continued cross-country vehicle travel during critical times of the year, and could remove or degrade habitat through proliferation of routes over 215,400 acres of black-tailed deer seasonal ranges. Alternatives 2-7 benefit deer by reducing open road densities in 16-17 watersheds (increasing habitat effectiveness) and eliminating disturbance associated with cross-country motorized vehicle travel.

Riparian Group: Alternative 1 could negatively affect habitat through proliferation of routes over 9,270 acres of riparian habitats and 2,500 miles of streams, continued vehicle use of up to 14 stream crossings, and allowing the creation of more such crossings. Alternatives 2-7 benefit species in this group by eliminating 11-14 stream crossings, prohibiting creation of additional crossings, and removing vehicle effects from 4.6-6 acres of mapped riparian habitat.

Cavity Nesting Group (Snag Association): Alternative 1 could negatively impact habitat through proliferation of routes that could lead to depletion of snags on

Hardwood Association: Alternative 1 could negatively affect 9,280 acres of hardwood habitats available for vehicle travel through proliferation of routes that could remove or degrade habitat. Alternatives 2-7 benefit species in this group by eliminating vehicle noise and disturbance on 12-14 acres of habitat, and preventing creation of additional routes.

Grassland/shrub-steppe Association: Alternative 1 could negatively affect 10,600 acres of hardwood habitats available for vehicle travel through proliferation of routes that could remove or degrade habitat. Alternatives 2-7 benefit species in this group by eliminating vehicle noise and disturbance on 12-14 acres of habitat, and preventing creation of additional routes.

Mature Pine Association: None of the alternatives would affect species in this association, as remaining mature pines are located in areas inaccessible to off-road motorized travel.

Migratory Landbird Conservation on the Klamath National Forest

Within the National Forests, conservation of migratory birds focuses on providing a diversity of habitat conditions at multiple spatial scales and ensuring that bird conservation is addressed when planning for land management activities.

As part of the Travel Management process, the Klamath National Forest has conducted an assessment of existing unauthorized routes within Forest boundaries. Any new construction, reconstruction and maintenance of system roads or trails will be conducted under a separate NEPA analysis and decision. Because current travel management efforts are directed at identifying which existing unauthorized routes will be formally added to the National Forest Transportation System while prohibiting cross-country travel, and because there is no expectation of new construction or development, no changes in the distribution or abundance of habitats available to migratory birds are anticipated. Changes in authorization are not anticipated to contribute to measurable increase in use levels, but the prohibition of cross-country travel is expected to result in less use across the landscape. Therefore, habitat functionality is expected to remain similar or more than, and levels of disturbance related to use are expected to remain similar to or less than, predecisional levels.

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Botanical Resources

Introduction

Of the Forest Service Regions, the Pacific Southwest Region contains the largest assemblage of sensitive plant species in comparison to its land base. Of the more than 8,000 vascular plant species occurring in California, well over half are known to occur on National Forest System (NFS) lands. This is due to topography, geography, geology and soils, climate, and vegetation, the same factors that account for the exceptionally high endemic flora of the State. Over 100 plant species are found only on NFS lands and no where else in the world (Powell 2001).

Management of plant, lichen, bryophyte and fungi species and habitat, and maintenance of a diversity of plant communities, is an important part of the mission of the Forest Service (Resource Planning Act of 1974, National Forest Management Act of 1976). Management activities on NFS lands must be planned and implemented so that they do not jeopardize the continued existence of threatened or endangered species or lead to a trend toward listing or loss of viability of Forest Service Sensitive species. In addition, management activities should be designed to maintain or improve habitat for rare plants and natural communities to the degree consistent with multiple-use objectives established in each Forest LRMP. Key parts include: developing and implementing management practices to ensure that species do not become threatened or endangered because of Forest Service (FS) actions; maintaining viable populations of all native and desired non-native wildlife, fish, and plant species in habitats distributed throughout their geographic range on NFS lands; and developing and implementing management objectives for populations and/or habitats of rare species. The Pacific Southwest Region has over 425 rare plant species to manage.

Management decisions related to motor vehicle travel can affect plant, lichen, bryophyte and fungi species, their habitats, and natural communities. Effects include, but are not limited to, death or injury to individual plants and habitat modification, including fragmentation, and changes in habitat quality, including increased risk of weed introduction and spread, change in hydrology, increased erosion, compaction, and sediment, risk to pollinators, loss of vegetation, over-collection, or other factors reducing or eliminating plant growth and reproduction (Trombulek and Frissell 2000).

Analysis Framework: Statute, Regulation, LRMP, and Other Direction

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

Endangered Species Act (ESA). The Endangered Species Act of 1973 (16 USC 1531 et seq.) requires that any action authorized by a federal agency not be likely to jeopardize the continued existence of a threatened or endangered species, or result in the destruction or adverse

modification of habitat of such species that is determined to be critical. Section 7 of the ESA, as amended, requires the responsible federal agency to consult the USFWS and the National Marine Fisheries Service concerning threatened and endangered species under their jurisdiction. It is Forest Service policy to analyze impacts to threatened and endangered species to ensure management activities are not be likely to jeopardize theircontinued existence, or result in the destruction or adverse modification of habitat of such species that is determined to be critical. This assessment is documented in a biological assessment (BA), summarized here and located in the process records located in the KNF Supervisor's Office in Yreka, CA.

Resource Planning Act of 1974, National Forest Management Act of 1976. The Management of plant and fungi species and habitat, and maintenance of a diversity of plant communities is an important part of the mission of the Forest Service

Presidential Executive Order 13112, Invasive Species, 64 FR 6183 (February 8, 1999). This order addresses prevention and control of the introduction and spread of invasive species.

Forest Service Manual 2670 and Forest Service Handbook 2609.25 provide direction regarding Forest Service sensitive species, which are identified by the Regional Forester. The Forest Service develops and implements management practices to ensure that rare plants and animals do not become threatened or endangered, and ensure their continued viability on National Forests.

Forest Service Manual 2353.03(2) provides direction to minimize damage to vegetation habitat while providing for motor vehicle use on National Forest System lands.

Recovery Plans, Conservation Assessments, and Conservation Agreements (these documents address the biology, management, and conservation of species within California):

- Recovery Plan for *Arabis macdonaldiana var. Eastwood* (U.S. Fish and Wildlife Service 1990)
- Conservation Assessment for *Cypripedium fasciculatum* and *Cypripedium montanum* (USDA Forest Service 2005).
- Conservation Assessment for *Buxbaumia viridis* (USDA Forest Service 2006).
- Conservation Assessment for *Ptillidium californicum* (USDA Forest Service 2006).
- Conservation Assessment for *Meesia uliginosa* and *Meesia triquetra* (USDA Forest Service 2005).
- Conservation Agreement for *Horkelia hendersonii*, and *Lupinus lepidus* var. *ashlandensis* (USDI USFWS 2002).

Klamath National Forest Land and Resource Management Plan (LRMP). The Bureau of Land Management and Forest Service adopted standards and guidelines for the management of habitat for late-successional and old-growth forest related species within the range of the northern spotted owl, commonly known as the Northwest Forest Plan. The language and direction from the Northwest Forest Plan were incorporated into the Klamath LRMP. The LRMP states: "Management activities on NFS lands must be planned and implemented so that they do not jeopardize the continued existence of threatened or endangered species or lead to a trend toward listing or loss of viability of Forest Service sensitive species. In addition, management activities should be designed to maintain or improve habitat for rare plants and natural communities to the degree consistent with multiple-use objectives established in each Forest land and resource management plan."

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

6-7 Manage for a distribution and abundance of plant and animal populations that contribute to healthy, viable populations of all existing native and desirable non-native species. Maintain populations throughout their historic range.

6-8 Sensitive species - survey project areas or assess presence of habitat

6-13 Management activities should be designed to maintain or increase population levels of desirable native plant species that currently have low population levels, of desirable plant species with limited habitat distribution and of desirable plant species that have problems with disease. Examples include Port-Orford cedar, sugar pine, Pacific yew, Brewer spruce, etc.

7-1 Enhance sensitive plant species populations and habitat to maintain reproducing, self-sustaining populations. Conduct an assessment to determine which sensitive species are at a higher risk.

7-2 Disturbances to plant populations and occupied habitat should be avoided during critical periods of plant growth. Individual projects shall develop project-level mitigations measures to avoid adverse impacts to sensitive species.

The following management direction applies to the area designated for management of *Calochortus persistens*.

MA5-77 Prohibit any ground disturbance that would adversely affect the known habitat (by introducing weedy species) or physically disturbing existing plants [in the Calochortus persistens 100-acre management area]. Disturbed areas near this habitat should be managed to exclude nonnative invasive plant species.

MA5-78 Conduct programmed or permitted activities within the management area so as not to adversely affect the habitat values for the *Calochortus[persistens]*.

MA5-81 Allow vehicular traffic on established roads. New road construction shall not be allowed in this management area. Off-highway traffic shall not be allowed.

The LRMP established Special Interest Areas (SIAs) on the KNF: botanical and geologic special areas, and botanical special areas (Table BR-1). These areas support outstanding or especially interesting natural or cultural features. The goal is to interpret the surroundings for public enjoyment and increased understanding of natural resources while maintaining the values for which the SIAs were established. Off-road motorized vehicle use within these SIAs is either excluded or discouraged.

Table BR-1. Botanical Special Interest Areas and Botanical and Geologic Special Interest Areas

Name	Ranger District	Acres	Feature/Significance
Botanical and Geologic Special Interest Areas			
Black Lava Butte and Callahan Lava Flow	GNRD	2,800	Basalt flow with lava tubes, spatter cones.
China Mountain	SSRD	900	Hemlock, whitebark pine, foxtail pine community. High elevation. Ultramafic soils.
Cook and Green Pass	HCOK	200	Diversity of crest zone plant species. Peridotite rock outcrops.
Cory Peak	HCOK	400	Serpentine crest zone sensitive species. Rock glacier.
Kangaroo Lake	SSRD	400	Sensitive plants and species diversity. Glacial features.
Preston Peak	HCOK	3,800	Diversity of conifer species. Glacial features.
Total Acres		4,700	
Botanical Special Interest Areas			
Bear Peak	HCOK	500	Conifer species found in granite glacial cirque.
Grey Pine	HCOK	400	Northern-most location of this species.
Duck Lake	SSRD	3,600	Diversity of conifers and endemic species.
Elk Hole	UKRD	200	Southern-most population of Alaska yellow cedar.
Horse Creek	HCOK	200	"Old growth" riparian vegetation.
Indian Creek Brewer Spruce	HCOK	100	Vigorous stand of this endemic species.
Lake Mountain Foxtail Pine	HCOK	100	Northern-most location of foxtail pine.
Little Shasta Meadow	SSRD	700	Diverse wet meadow plant community.
Mount Ashland/Siskiyou Peak	HCOK	800	Endemic plants crest zone community.
Observation Peak	HCOK	500	Endemic plants crest zone community.
Poker Flat	HCOK	100	Sensitive plants and species diversity.
Red Mountain	HCOK	400	Serpentine endemic species.

Name	Ranger District	Acres	Feature/Significance
Rhododendron Patch (Mill Creek)	HCOK HCOK	100	Large inland patch of coastal Rhododendron.
Rock Fence Creek	SSRD	100	Serpentine riparian plant community.
Scott Mountain	SSRD	500	Serpentine crest zone endemic plant species.
Seiad Baker Cypress	HCOK	1,000	Large stand of this rare conifer species.
Sutcliff Creek	HCOK	100	Example of Port-Orford cedar.
White Mountain	HCOK	100	Only population of *Sausseria americana* in California.
Total Acres		9,500	
Key: SSRD Salmon River/Scott River Ranger District HCOK Happy Camp/Oak Knoll Ranger District GNRD Goosenest Ranger District UKRD Ukonom Ranger District			

Management direction for special interest areas for Botanical Resources includes:

MA7-7 Develop recreational use that is compatible with the goals and objectives of the SIA. Where there is established recreational use of an area, develop the SIA to accommodate that use.

MA7-8 Restrict OHV use.

MA7-10 Manage recreational settings to generally achieve semi-primitive or roaded natural ROS conditions.

There are nine Research Natural Areas (RNAs) on the Klamath National Forest: Antelope Creek Lakes, Bridge Creek, Crater Creek, Haypress Meadows, Limestone Bluffs, Marlbe Caves, Rock Creek Butte, Stove Spring Canyon, and Sugar Creek. There are no unauthorized routes proposed within RNAs; therefore, these areas will not be discussed further in this document.

The LRMP included standards and guidelines for management of survey and manage species – rare or uncommon species about which little was known. Through a series of lawsuits and agreements, the survey and manage species were given different status. The species that were designated USFS sensitive are addressed in the section on sensitive species. Species that were not designated sensitive are addressed as other species of interest.

Effects Analysis Methodology

The analysis of effects on rare plant species was a two step process. A map and record review identified all listed or proposed rare species that were known or were believed to have potential to occur on or near unauthorized routes. Fourteen species were identified. Due to the small number of species, they were analyzed individually rather than by habitat groupings, as has been done in other Travel Management analyses. These routes were then analyzed for potential impacts to TES species.

Assumptions Specific to the Botanical Resources Analysis

- Vehicle use on and off established routes has affected or has the potential to affect rare plant populations, either directly by damage or death to individual plants from motor vehicles, or indirectly by altering the habitat through soil disturbance, changes in hydrologic functioning, or by the introduction of nonnative, invasive plant species.
- Motor vehicle use is unlikely to impact certain rare plant habitats due to the steep or rocky nature of the surrounding terrain.
- Motor vehicle use is likely to impact rare plant habitats, such as meadows and lava caps, which exist on gentle slopes or flat terrain with little or no vegetation or natural barriers to motor vehicles.
- Without specific prevention and/or control measures, invasive nonnative plants (weeds) will continue to spread along and within surfaced and unsurfaced motor vehicle roads, trails and areas.
- Impacts to rare plant species are assumed to be limited to within 100 feet of the motorized routes, with most direct effects occurring within 30 feet and most indirect effects occurring within 100 feet.
- Volume of traffic on the NFTS (and proposed additions to the NFTS) will remain relatively static into the foreseeable future, although the type of use could change.
- Vehicles will remain on designated routes.
- All vehicles are assumed “equal”. The impacts to sensitive species from a motorcycle are assumed equal to those impacts from a four-wheeled vehicle.
- No new roads will be constructed under any alternative. All routes included in the action alternatives currently exist and are being used by motor vehicles.
- Seasonal closures of NFTS roads have no impact to rare plants or their associated habitats.

Data Sources

- GIS layers of routes; occurrences of rare plants, and Forest vegetation.
- Route-specific botanical data for Threatened, Endangered, and Sensitive plant species, and special habitats such as meadows.
- Route-specific botanical survey information. Every route adjacent to a TES or rare plant population was field reviewed. See Route Survey Information – Botany Spreadsheet in the project file for specific routes and areas surveyed, and evaluation of botanical information.
- Forest Service Botanists’ expert knowledge.

Indicators

The following general indicator measures were used to compare alternatives. These indicator measures were selected based on literature review of possible impacts to sensitive plants/fungi and plant communities, knowledge of native plant connectivity, and professional judgment, and differ somewhat from some of the indicators used in other Travel Management analysis documents. The distance for direct effects (30') was chosen based on the maximum distance a vehicle might travel off a road prism for parking, and thus crush or harm individual plants. The distance for indirect effects (0-100') is based on the potential for impacts to habitat from soil compaction or changes in water flow or infiltration.

- Acres open to cross-country motorized travel.
- Miles of roads and motorized trails proposed for addition to the NFTS within 100 feet of rare plant sites.
- Acres of rare plant sites within 100 feet of roads and trails proposed for addition to the NFTS.
- Miles of roads and trails proposed for addition to the NFTS in special management areas with sensitive plant species.

Botanical Resource Methodology by Action

1. Direct and indirect effects of the prohibition of cross-country motorized vehicle travel

Short-term timeframe: 1 year. Short-term effects include immediate effects from changes in travel management that will be evident within the first year of implementation.

Long-term timeframe: 20 years.

Spatial boundary: KNF lands within 100 feet of unauthorized or proposed routes in addition to the entire area of cross-country travel.

Indicators: All indicators were used.

Methodology: GIS analysis of routes and TES plant sites.

2. Direct and indirect effects of adding facilities to the NFTS

Short-term timeframe: 1 year.

Long-term timeframe: 20 years.

Spatial boundary: KNF lands within 100 feet of unauthorized or proposed routes.

Indicators: All indicators were used.

Methodology: GIS analysis of routes and TES plant sites.

3. Direct and indirect effects of changes to the NFTS

This action involves changing the type of vehicle allowed on existing NFTS roads. The roads are in place and have been utilized by a variety of vehicles for many years, including passenger cars, street-legal pickup trucks with all-terrain mud and snow tires, logging trucks, and motorcycles. Street-legal vehicles with any type of tire will be allowed to continue using these NFTS roads. There would be no effects to rare plants from this activity and it is not addressed further in this section.

4. Cumulative effects

Short-term timeframe: not applicable; cumulative effects analysis will be done only for the long-term timeframe.

Long-term timeframe: 20 years.

Spatial boundary: KNF.

Indicators: All indicators were used.

Methodology: GIS analysis of routes and TES plant sites.

Cumulative effects are the combined direct and indirect effects of this project and those from ongoing or foreseeable projects that could affect botanical resources, and especially rare plants. All management projects on the KNF have separate botanical analyses and Biological Assessments/Biological Evaluations that document project effects. Projects include project design standards that are considered adequate to reduce or eliminate effects from management activities on rare plants. Vegetation management activities such as fuels reduction or timber harvest do not change the vegetative type, although they may affect the seral condition of the plant community. Projects that kill or remove vegetation and compact the soil produce the types of effects similar to an unauthorized route. Effects from foreseeable projects overlap with Travel Management through loss of individuals, or loss/degradation of habitat caused by road construction or decommissioning; these effects are all generally long term in nature. Therefore, this analysis focuses on the cumulative effects of this project and any roads or trails proposed in ongoing or foreseeable management projects (Appendix B).

Affected Environment

Cross-country travel is currently allowed on approximately 1.2 million of the 1.7 million acres on the KNF. Many of these acres cannot be accessed by motorized vehicles due to terrain and vegetation density.

The KNF, located mostly in Siskiyou County, California, with a small portion in Jackson County, Oregon, contains more than 2,000 species of plants due to varying elevation and precipitation zones that occur within the area. Plant communities include a variety of vegetation types arranged in dynamic patterns influenced by geology, climate, and past and recent disturbances. Plant communities continually change in response to natural and human created disturbances such as wildfires, ecological succession, climate change, wind, drought, insects, and management activities.

The geologic history of the area, including floods, volcanic eruptions, landslides and erosion, has shaped the landscape of the Forest into a unique combination of landforms and vegetation patterns. This unique combination of geology and topography has produced a distinctive pattern of steep, heavily timbered slopes on the western portion of the Forest and gently rolling, open woodlands on the eastern portion. Ecological habitats ranging from low to high elevation include: juniper, sagebrush, grasslands, scrub oak, mixed chaparral, ponderosa pine, montane shrubland, bitterbrush, mixed conifer (east and west versions), Douglas-fir, lodgepole pine, true fir (east and west), montane meadows, and alpine grassland. Riparian areas and wetlands occur throughout. Given this combination of physiography and climate, habitats are highly variable and retain a legacy of botanical diversity. Structural elements such as size and density of vegetation vary greatly within a type depending on the frequency and intensity of fires and other disturbances or past management.

Approximately 2,000 vascular plant taxa, which represent approximately 25 percent of the California flora (Hickman 1993), are known to occur on the Klamath National Forest. Motorized use can directly impact all plants, plant habitat, and plant communities exposed to vehicles; however, most plant communities that are accessible to vehicles on the KNF are common and well-distributed across the landscape. The exceptions are those plant communities in the Mt. Ashland crest zone where the Mt. Ashland lupine, Henderson's horkelia, and Howell's tauschia can be found. Rare plant communities that are not accessible to vehicles include the Special Interest Areas on the Scott River District (Duck Lake, Rock Fence Creek, and Scott Mountain) that support serpentine endemics and a wide variety of conifer species.

Rare plant species, as referred to in this analysis, include the following 55 plant species known to occur or which may have habitat on the KNF: 4 federally listed species and 1 FWS Candidate species, 37 FS Region 5 Sensitive plant species, 7 rare mosses, 6 rare fungi, 1 lichen, and 26 other species of interest.

Federally Listed and FWS Candidate Species

There are currently four federally listed plant species on the KNF: *Arabis macdonaldiana, Astragalus applegatei, Fritillaria gentneri,* and *Phlox hirsuta*. *Astragalus applegatei* and *Fritillaria gentneri* have not been found on the KNF. The FWS Route Designation Project Design

Criteria letter of concurrence was developed for Federally listed species (USFWS 2006). *Phlox hirsuta* and *Arabis macdonaldiana* are included in the letter. By following the recommended design criteria, route designation will meet the "No Effect" or "Not likely to adversely affect" determinations. Forests may tier to this consultation with no further consultation. The project design criteria were reviewed and applied to this project; documentation is contained in the Klamath National Forest Travel Management Project Compliance with Project Design Criteria for "No Effect" or "May Affect Not Likely to Adversely Affect" Determination for TE Species, located in the project files in the Supervisor's Office in Yreka, California. There are no proposed routes within 100 feet of occupied habitat of these four species in any of the action alternatives, and none occur on the 1.2 million acres that would be open to off-road travel in Alternative 1. Federally listed species and habitat will not be considered further in this analysis.

Calochortus persistens is a FWS Candidate species on the KNF. There is one route within 30 feet of *C. persistens* habitat in Alternative 2. Informal consultation was conducted by telephone and email with the USFWS on April 10, 2009 and April 16, 2009 (See "Botanical Consultation – *Calochortus*" in the project files). The decision was made to drop this route from other action alternatives and eliminate it from the preferred and selected alternative, so no additional consultation was conducted. The *C. persistens* special management area is closed to off-road travel by a Forest Order. The Order will remain in effect even if Alternative 1 is selected, so there will be no impacts to this species from motorized travel under any alternative. Effects to *C. persistens* were analyzed for Alternatives 1 and 2; there are no impacts from any other action alternative.

Table BR-2. Federally Listed and FWS Candidate Species from the Klamath NF

Status	Species	Habitat	Number of Populations on KNF[a]	Status / Trend
CA SE	*Arabis macdonaldiana* McDonalds rock cress	Ultramafic soils, 3,900-7,200 ft. and granite soils in Jeffrey pine. Western Klamath Ranges and outer North Coast Ranges.	2	Generally in areas with little resource or land use conflicts. Due to rarity, all populations need protection.
OR SE +	*Astragalus applegatei* Applegate's milkvetch	Alkaline floodplains, around 4,100 ft.	None known	Due to rarity all populations need protection (USFWS recovery plan)
OR SE +	*Fritillaria gentneri* Gentner's fritillary	Grassland and chaparral habitats, within or at edges of dry, open woodlands, < 4,450 ft.	None known	Due to rarity all populations need protection (USFWS draft recovery plan)
CA SE	*Phlox hirsuta* (E) Yreka phlox	Open, rocky serpentine ridges and slopes, 2,400-4,400 ft. Extreme eastern Klamath Range.	2	Due to rarity all populations need protection (USFWS recovery plan 2006b)
	Calochortus persistens (C) Siskiyou mariposa-lily	Open, rocky ridge tops at 6,000 ft. Eastern Klamath Range	12	All populations need protection. (USFWS draft Conservation Agreement)

[a] Several populations may make up an occurrence.

Key:
CA SE California State-listed Endangered
OR SE Oregon State-listed Endangered
\+ Suspected to occur, but not currently documented.

Forest Service Sensitive Plant Species

Sensitive species are those vascular plant, bryophyte, lichen, and fungi species eligible for listing under the Endangered Species Act, or whose viability is of concern. Fifty-one sensitive plant species are known, or thought likely to occur on Klamath National Forest (USDA 2006), including 13 species from the Survey and Manage list that were added in 2004. Forest Service sensitive plant species for the KNF are listed in Table BR-3.

Table BR-3. Forest Service Sensitive Plant Species for the Klamath National Forest

Status	Species	Habitat	Number of known populations[a]
	Vascular Plant Species		
+	*Botrychium crenulatum* Scalloped moonwort	Moist habitats including meadows, seeps, springs, riparian areas. Often on edge of creek banks in conifer forests.	None
+	*Botrychium lunaria* Common moonwort	Moist habitats, meadows, streamsides, seeps, springs.	None
+	*Botrychium minganense* Mingan moonwort	Conifer and hardwood forests, riparian areas, meadows, shrublands >4,500’	None
+	*Botrychium montanum* Mountain moonwort	Late-successional/old growth conifer forests in wet shady areas with saturated soils. >4,500’	None
H	*Botrychium pinnatum* Northwestern moonwort	Along shaded and open streams and meadows in conifer forests, moderate to high elevations.	One historic, near KNF
+	*Botrychium virginianum* Ratllesnake fern	Riparian areas heavily shaded by conifer or conifer/hardwood overstory.	None
	Calochortus greenei Greene’s mariposa-lily	Dry open areas in woodlands and forest and stand edges, 2,400-6,500’	2
CA SR FC	*Calochortus persistens* Siskiyou mariposa-lily	Dry, rocky, exposed ridge tops, around 6,000’	12
	Campanula wilkinsiana Wilkin’s harebell	Riparian, rocky, open streamsides in conifer forest to above timberline, 5,700-8,600 ft.	2
	Chaenactis suffrutescens Shasta chaenactis	Rocky open slopes and cobbly river terraces on ultramafic soil, 2,600-6,900’	2
+	*Collomia larsenii* Talus collomia	Volcanic peaks and cinder cones, >7,000’	0
	Cypripedium fasciculatum Clustered lady’s slipper	Variable, conifer and hardwood forest, 1650-5600’	106
	Cypripedium montanum Mountain lady’s slipper	Moist areas, dry slopes, mixed evergreen and coniferous forests, 1,600-5,900’	92
	Draba carnosula Shasta draba	Rocky ultramafic or granodiorite slopes and cliffs, >6,000’	3
	Epilobium oreganum Oregon fireweed	Wet meadows, bogs, streamsides, usually on ultramafic soils, 1,500-7,400’	3
CA SE	*Eriogonum alpinum* Trinity buckwheat	Loose ultramafic gravel, open subalpine forest, 6,700-9,000’	2
	Eriogonum hirtellum Klamath mountain buckwheat	Bald serpentine outcrops or gravelly slopes and ridges, 200-5,500’	42

Status	Species	Habitat	Number of known populations[a]
	Eriogonum ursinum Blushing wild buckwheat	North facing rocky ridge tops, openings in montane shrublands, 5,300-6,200’	6
+	*Erythronium citrinum var. roderickii* Roderick’s fawnlily	Granitic or weathered ultramafic soils in mid-montane mixed conifer forests with somewhat open canopy	None
+	*Eucephalis vialis* Wayside aster	Conifer forests, dry upland sites, in canopy gaps and forest edges	None
+	*Frasera umpquaensis* Clustered green-gentian	Mtn meadows, moist openings in red fir forests, 550-6,500’	None
	Horkelia hendersonii Mt. Ashland horkelia	Dry, open, gravelly slopes and ridges, openings in red fir forest, 6700-7500’	7
	Ivesia pickeringii Pickering’s ivesia	Conifer forest, seasonally wet spots or dry edges of wet meadows, ultramafic or gabbro soils, 2,700-4,900’	8
	Lupinus lepidus var. ashlandensis Mt. Ashland lupine	Open, rocky ridge tops on Sandy soils, > 6,000’	1
H	*Mimulus evanescens* Ephemeral monkeyflower	Seasonal wetlands, 400-5,500 ft.	One historic
+	*Minuartia stolonifera* Scott Mtn. sandwort	Rocky slopes on ultramafic soils, mixed conifer forests, 4,100-5,300 ft.	5
	Parnassia cirrata var. intermedia Fringed grass of Parnassus	Hillside seeps and fens in montane mixed conifer forest.	None
	Pedicularis howellii Howell’s lousewort	Edges of openings, shad in conifer forest.4,000-6,500’	28
	Phacelia cookei Cooke’s phacelia	Loose sandy-ash soils on old mud flow, disturbed or open sites with sparse vegetation.	1
	Phacelia greenei Scott Valley phacelia	Bare ultramafic ridges and openings in Jeffrey pine and red fir, 5000-7000’	16
	Phacelia inundata Playa phacelia	Alkaline flats, dry lake margins, 500-6,600’	1
+	*Polemonium chartaceum* Mason’s sky pilot	Serpentinite, granitic, and volcanic substrates, rock and talus, 5900-13,000’	None
	Raillardella pringlei Showy raillardella	Perennial springs, seeps, fens, or streams on ultramafic soils, 400-7500’	5
	Rorippa columbiae Columbian yellow cress	Seasonally inundated areas along rivers, playas, snowmelt streams, lakes, wet meadows, and drying lakebed, 4,200-5,600’	2
	Smilax jamesii English Peak greenbriar	Riparian areas and draw, usually in mixed conifer or red fir forest or montane chaparral, 1900-6000’	17
	Tauschia howellii	Openings in subalpine and upper montane conifer forest, on decomposing	9

Status	Species	Habitat	Number of known populations[a]
	Howell's tauschia	granitic soils on ridge tops and upper slopes, 5,500-8,300'	
	Thermopsis robusta Robust false lupine	Openings, along ridge lines, lower montane forest, roadsides, openings in Douglas-fir and mixed evergreen forest, < 4,500'	13
	Fungi Species		
	Boletus pulcherrimus	Coastally influenced forest, Douglas-fir with hardwoods, moist sites.	1
	Cudonia monticola	Mature, moist conifer forest	2
	Dendrocollybia racemosa	Mixed forest with coast live oak, tanoak and Douglas-fir, along streams	2
	Phaeocollybia olivacea	Conifer and hardwood forest where it can grow in the humus layer, mid-seral forest, incl. partial cut units.	5
	Sowerbyella rhenana	Mature conifer forest.	5
	Tricholomopsis fulvescens	Old growth conifer forest, >3,300'	2
	Bryophyte Species		
+	*Buxbaumia viridis* Green bug moss	Logs or stumps in late stages of decay, on humus or mineral soil, cool moist spots at mid elevations	None
	Fissidens aphelotaxifolius Brook pocket moss	Wet soil, humus, rock along narrow streams and near small waterfalls, in damp or wet crevices of cliffs, <6,300'	1
	Helodium blandowii Blandow's bog moss	Wet meadows and seeps in subalpine conifer forest and alpine lakes.	3
	Meesia triquetra Three-ranked humpmoss	Montane fens, 4,300-9,700'	3
	Meesia uliginosa Broadnerved humpmoss	Montane fens, 5,900-9,200'	5
	Mielichhoferia elongata Elongate copper moss	Metamorphic, sedimentary, limestone, granite and serpentine rock outcrops, seasonally moist to moist soils, < 3,550'	1
	Ptilidium californicum Pacific fuzzwort	Epiphytic on tree trunks, logs and stumps, mid-elevation Douglas-fir and true fir forest on moist north-facing slpes or near riparian areas.	101
	Lichen species		
+	*Hydrothyria venosa* Veined water lichen	In shallow streams fed by cold water streams	None

[a] Several populations may make up an occurrence.

Key:

CA SE California State-listed Endangered
CA SR California State-listed Rare
OR SE Oregon State-listed Endangered
FC Federally listed Candidate species
\+ Suspected to occur, but not currently documented.
H Historic occurrence, not currently documented

Other Species of Interest

Twenty-six other species of interest (formerly survey and manage) occur on the KNF. Review of existing information determined that the KNF is not within the range of 18 species and has no habitat for one species; four other species have never been found on the Forest. The remaining three species do not occur within 100 feet of any mapped unauthorized route. These other species of interest are not considered further in this analysis.

Port-Orford-Cedar

Port-Orford-cedar (*Chamaecyparis lawsoniana*) is an ecologically, economically, and socially important tree species with a limited natural range of northwestern California and southwestern Oregon. It is addressed in a separate section of this document.

Noxious Weed Infestations

Regional biodiversity is at increased risk due to alterations in human uses, fire regimes, climatic change, and changes brought about by weed invasion (D'Antonio et al. 2004). Noxious weeds, especially when abundant, directly compete with native plants and can cause displacement of natives on a local scale. Potential impacts include: alteration of disturbance regimes (including wildfire); changes in the food base for wildlife species; soil erosion and loss of soil carbon storage; and decreases in range or forest productivity and altered hydrology. A thorough discussion of noxious weeds is included in the Non-Native Invasive Species section.

Environmental Consequences

All federally listed/candidate species and Region 5 sensitive species were considered in this analysis; however, none of the federally listed species will be affected by any alternative, so they are not considered further in this section. The one candidate for listing (*Calochortus persistens*) is found in a small management area that is currently protected from off-road vehicle use by a Forest Order. The KNF botanist has determined that this species is not currently affected by motorized use, and informal consultation with the USFWS (conducted by telephone and email on April 10, 2009 and April 16, 2009) supported this determination. The Forest Order would remain in place even if Alternative 1 was selected, so there would be no effect from off-road vehicle travel to this species under any alternative. It is not considered further in this section. Sensitive species located on slopes less than 35% (Alternative 1), or within 100 feet of routes proposed for addition to the NFTS (action alternatives), were analyzed for effects.

Management decisions related to motor vehicle travel can affect plant and fungi species, their habitats, and natural communities. Effects include, but are not limited to: death or injury to plants and habitat modification, habitat fragmentation, decrease in habitat quality, including increased risk of weed introduction and spread, change in hydrology, increased erosion, compaction, and

sediment, risk to pollinators, loss of vegetation, overcollection, or other factors reducing or eliminating plant growth and reproduction (Trombulak and Frissell 2000).

Direct effects occur when individual plants are broken or crushed by vehicles. Cross-country travel by merely one vehicle has the potential to crush plants. Kellomaki and Saastmoinen (1975, *in* Yorks et al. 1997) noted that the initial use of a trail creates the greatest deterioration; even as few as 1 to 20 passes have been shown to reduce plant cover by stunting plants (Adams et al. 1982, *in* Ouren et al. 2007). Root exposure and/or direct root damage may occur due to vehicle passes over vegetation, particularly in loose soils, or in wet soils susceptible to rutting. These actions lead to a suite of effects such as altered growth, plant vigor, reduced seed set, or death (Wilshire et al. 1978; Cole and Bayfield 1993). Direct effects are dependent upon the intensity and timing of disturbance. The extent of effects is also dependent upon the number of plants at a specific location.

Indirect effects are caused by the action but are expressed later in time, or further removed in distance, but are still reasonably foreseeable. Indirect effects are generally related to habitat disturbance or alteration as a result of soil erosion or compaction, or displacement of native species by nonnative or invasive species. Soil compaction, erosion, and modification of soil properties can affect the distribution, abundance, growth rate, reproduction, and size of plants (Ouren et al. 2007). Wilshire and Nakata (1976) report that initial use by OHVs results in a loss of cohesion and lateral displacement of soils, while repeated use leads to compaction. Compaction can result in reduced seed germination, seedling survival, soil water infiltration (Wilshire et al. 1978), and reduced plant and root growth. Vehicles traveling cross-country may destroy the biological soil crust that holds the soil surface in place. The effects of soil erosion on plants can include undercutting of root systems as routes are enlarged by erosion, creation of new erosion channels in areas not used by vehicles, wind erosion of adjacent destabilized areas, burial of plants by debris eroded from areas of use, and reduction of the biological capability of the soil by physical modification and stripping of fertile layers (Wilshire et al. 1978). Soil compaction and the subsequent decrease in infiltration and distribution of water through the soil profile can lead to decreased moisture available for plant growth. Vehicles traveling through mud easily alter surface hydrology, potentially blocking water from sensitive plant habitat, or conversely, potentially flooding it. Vehicle impacts to soils can also contribute to roadside invasions of exotic plant species by reducing native plant vigor and creating areas of competition-free space that are open to invasion (Ouren et al. 2007; Trombulak and Frissell 2000; Wilshire et al. 1978). Any of these changes in soil properties can create conditions unsuitable for seedling development such that the sustainability or expansion of plant populations could be affected. This would be especially problematic with rare plant populations that are, by definition, limited in size or distribution.

Dust from motor vehicle use has also been shown to decrease native plant cover and vigor by reducing rates of photosynthesis, respiration, transpiration (Spellerberg and Morrison 1998, *in* Ouren et al. 2007), and in some cases to alter community structure (Trombulak and Frissell 2000).

Habitat fragmentation resulting from increased density of roads may create "islands" of otherwise suitable habitat that are too small to allow for maintenance of populations of certain plants. Fragmentation also results in a greater amount of edge area relative to the amount of interior habitat area. Newly created edges experience changes in microclimate conditions which may alter plant communities (Collinge 1996). Numerous studies have addressed the results of habitat fragmentation to plant populations and the pollinators upon which they depend (Young et al. 1996; Jules 1998; Harrison and Bruna 1999). No habitat fragmentation studies have been conducted for the sensitive plant species analyzed in this report; their responses to habitat fragmentation are not known. However, the routes being considered for addition to the NFTS are existing and being used, so it is assumed that any habitat fragmentation effects have already occurred.

Wetlands and associated plants may be indirectly affected by cross-country travel. Sediments and chemicals washing into wetlands from road or cross-country travel may compromise water quality. Vehicle travel in or adjacent to wetlands may create ruts that do not heal by themselves, and allow water to flow out of the wetland; over time the wetland may dry to the extent that it no longer supports wetland vegetation or provides wetland functions.

Cumulative effects result from the incremental impact of an action when added to the effects of past, present, and reasonably foreseeable future actions. Past activities are considered part of the existing conditions and are discussed within the Affected Environment section above.

The ongoing and foreseeable projects that could impact rare plants include vegetation management projects (timber harvest, fuel reduction), ground-disturbing special use permits, livestock grazing, and road construction or reconstruction. Vegetation treatments are anticipated to be the primary activity that will alter forest vegetation and could impact sensitive plants and habitat. These types of activities will likely occur on at least 3,000 acres per year in the reasonably foreseeable future. The effects of these projects on TES plants are, or will be analyzed in each project environmental analysis. Permitted grazing has occurred on the KNF for over 100 years; animal numbers and the number of allotments have been significantly reduced over that timespan. Monitoring has indicated that LRMP standards have been applied to areas with rare plants, and have successfully protected plant populations (USDA Forest Service 2008, page 6). Road construction activities would have the same types of effects on plants as the actions proposed in this project; these activities are reviewed in detail for cumulative effects for this project and in separate environmental analyses for each road construction project. All proposed

management projects would be surveyed for the occurrence of rare plants, and mitigation measures would be developed for each project to minimize the effects of these activities on TES species or Other Species of Interest. Appendix B provides a list and description of ongoing and reasonably foreseeable projects on the KNF.

Alternative 1

Direct and indirect effects of the prohibition of cross-country motorized vehicle travel

Alternative 1 does not prohibit cross-country travel on the Forest, so 1.2 million acres would remain open for off-road use. Under this alternative, it is impossible to quantify when and where rare plant species and habitats would be impacted by motor vehicles; however, surveys have identified 26 species occupying approximately 3,059 acres in areas open to motorized vehicles. All plants within these known populations (and others that have not been identified) could be subject to crushing or damage in both the short and long term. Indirect effects include adverse effects to habitat from soil disturbance or displacement, changes in drainage, or competition with non-native plants. It is reasonable to assume that some plants (and perhaps some occurrences) would be lost entirely.

Table BR-4. Sensitive species within 100 feet of unauthorized routes under Alternative 1

Route	Species	Miles	Within 30 feet	Within 100 feet	*Acres Within 100 feet*
Unauthorized route #					
40S01.1	*Horkelia hendersonii*	0.25	X	X	*1.64*
43N16.1	*Phacelia cookei*	0.48	X	X	*7.19*
46N09.2	*Calochortus greenei*	0.19	X	X	*1.41*
70.2	*Meesia triquetra*	0.30		X	*0.16*
8Q020.2	*Rorippa columbiae*	0.45		X	*1.51*
96.17	*Calochortus persistens*	0.83	X	X	*5.66*
96.17D	*Calochortus persistens*	0.10	X	X	*1.04*
96.17E	*Calochortus persistens*	0.12	X	X	*0.61*
S-97.1	*Phacelia cookei*	0.49	X	X	*4.56*
S-97.12	*Phacelia cookei*	0.78	X	X	*10.22*
S-97.12A	*Phacelia cookei*	0.18	X	X	*5.18*
S-97.2A	*Rorippa columbiae*	0.59	X	X	*8.34*
52-06	*Thermopsis robusta*	0.28	X	X	*1.34*
55-04	*Calochortus persistens*	0.10	X	X	*0.39*
57-13	*Meesia uliginosa*	0.12	X	X	*0.74*
Totals		***6.23***			***48.99***

Fifteen occurrences of rare plants are within 100' of unauthorized routes, and 13 are within 30', potentially affecting about 49 acres of habitat. Because of the expected continued use of these routes, the 13 species within 30' could be subject to direct effects of crushing by tires. All 15 species could be at risk of indirect effects, including loss of vegetation, changes in hydrology, accelerated erosion, soil compaction, and competition with noxious weeds.

Two unauthorized routes (0.16 mile total) enter two SIAs with sensitive plants. KNF botanists determined that use of these two routes is not currently adversely impacting the sensitive plants because vehicle use has been confined to the disturbed area and there is no evidence of off-road use. No direct or indirect effects on sensitive plants have been observed.

Implementation of this alternative would indirectly impact sensitive species in the long-term by increasing the risk of weed introduction and spread, both on established routes and on any that may be created in the future.

Direct and indirect effects of adding facilities to the NFTS

Alternative 1 does not add motorized routes to the NFTS. There would be no effects to Botanical Resources.

Cumulative effects

Cumulative effects are the effects of continued motor vehicle use on 1.2 million acres of the KNF, added to the effects of ongoing and reasonably foreseeable management projects on the KNF. Ongoing and reasonably foreseeable activities will all receive pre-project surveys, and mitigation measures will be applied to ensure that viability of plant occurrences is not compromised. Biological Assessments/ Evaluations will be prepared to document any potential effects on TES species. These types of projects have historically had minimal to no effects on TES species and Other Species of Interest due to the application of project design standards, conservation strategies and mitigation measures.

Road-related activities would have the same type of effects as the actions proposed under this project and are addressed here. These activities would add 15 miles of ML 1 road (closed to public vehicle use) and 30 miles of ML 2 road to the NFTS, and remove 50 miles of road (48 miles of decommissioning and conversion of 2 miles of road to a hiking trail) from the NFTS. None of these activities is within 100 feet of a rare plant occurrence, and none are within SIAs. Cumulative effects are the same as those described under direct and indirect effects.

Determination of Effects

Alternative 1 may affect individuals, but is not likely to result in a trend toward Federal listing or a loss of viability for *Calochortus greenei, Calochortus persistens, Chaenactis suffrutescens,*

Cypripedium fasciculatum, Cypripedium montanum, Draba carnosula, Eriogonum alpinum, Eriogonum hirtellum, Helodium blandowii, Horkelia hendersonii, Ivesia pickeringii, Lupinus lepidus var. ashlandensis, Meesia triquetra, Meesia uliginosa, Mimulus evanescens, Minuartia stolonifera, Pedicularis howellii, Phacelia cookei, Phacelia greenei, Phaeocollybia olivacea, Ptilidium californicum, Raillardella pringlei, Rorippa columbiae, Smilax jamesii, Tauschia howellii, Horkelia hendersonii, Lupinus lepidus var. *ashlandensis*, *Phacelia cookei* and *Thermopsis robusta* (see BE for analysis and details).

Alternative 2

Direct and indirect effects of the prohibition of cross-country motorized vehicle travel

Prohibiting cross-country travel would discontinue vehicle use over 1.2 million acres of the Forest. Sensitive plants would be protected from direct effects of crushing or damage from tires in both the short and long term. Indirect effects such as soil disturbance or displacement, changes in drainage, or loss of vegetative cover would be eliminated.

Over the long-term, through loosening of soils and the return of native vegetation, disturbed sites could regenerate sufficiently to support native plant communities.

Direct and indirect effects of adding facilities to the NFTS

Under Alternative 2, one short route (600 feet) proposed for addition to the NFTS is within 30 feet of a sensitive species site, affecting about ¾ acre. The species, *Meesia uliginosa*, occurs in montane fens. The proposed route is upslope of the fen and past vehicle use has been confined to the route; there has been no disturbance to *Meesia* habitat. The KNF botanist indicates that the *Meesia uliginosa* occurrence is not threatened by the proposed route (see BE for more information).

Alternative 2 proposes two areas (65 acres) where off-road motorized use is not prohibited: the Humbug and Juniper Flat open riding areas. There are no sensitive plants within 100 feet of either area; sensitive plants would not be affected by motorized use in these areas.

There are no proposed routes in SIAs under this alternative.

Cumulative Effects

Cumulative effects are the effects of continued motor vehicle use on 1.2 million acres of the KNF, added to the effects of ongoing and reasonably foreseeable management projects on the KNF. Ongoing and reasonably foreseeable activities will all receive pre-project surveys, and mitigation measures will be applied to ensure that viability of plant occurrences is not compromised. Biological Assessments/ Evaluations will be prepared to document any potential effects on TES species. These types of projects have historically had minimal to no effects on TES species and

Other Species of Interest due to the application of project design standards, conservation strategies and mitigation measures. Any effects from vegetation management activities would be dwarfed by the beneficial effects of prohibiting cross-country motorized travel on the KNF.

Cumulative effects of road-related activities include the addition of 15 miles of ML 1 roads and 122 miles of ML 2 roads and motorized trails to the NFTS, removal of 50 miles of road, and designation of two areas where cross-country travel is allowed (65 acres). None of the ongoing or foreseeable actions is within 100 feet of a rare plant site, and none are within SIAs; no negative impacts to rare plants and their habitats from ongoing or foreseeable road-related activities are expected to occur. Cumulative effects are those described under direct and indirect effects. Cumulative effects are considered to be beneficial due to the reduced risk of direct and indirect impacts to rare plants from cross-country motorized use.

Determination of Effects

No sensitive species would be adversely affected by this alternative and all would benefit from the prohibition of cross-country travel.

Alternative 3

Direct and indirect effects of the prohibition of cross-country motorized vehicle travel

Prohibiting cross-country travel would discontinue off-road vehicle use over 1.2 million acres of the Forest; benefits from this prohibition are discussed under Alternative 2.

Direct and indirect effects of adding facilities to the NFTS

No new facilities would be added under this alternative. There would be no direct or indirect effects.

Cumulative effects

Cumulative effects are the effects of continued motor vehicle use on 1.2 million acres of the KNF, added to the effects of ongoing and reasonably foreseeable management projects on the KNF. Ongoing and reasonably foreseeable activities will all receive pre-project surveys, and mitigation measures will be applied to ensure that viability of plant occurrences is not compromised. Biological Assessments/ Evaluations will be prepared to document any potential effects on TES species. These types of projects have historically had minimal to no effects on TES species and Other Species of Interest due to the application of project design standards, conservation strategies and mitigation measures. Any effects from vegetation management activities would be dwarfed by the beneficial effects of prohibiting cross-country motorized travel on the KNF.

Cumulative effects of road-related activities include the addition of 13 miles of ML 1 roads and 26 miles of ML 2 roads and motorized trails to the NFTS, and removal of 50 miles of road. None of the ongoing or foreseeable actions is within 100 feet of a rare plant site, and none are within SIAs; no negative impacts to rare plants and their habitats from road-related activities are expected to occur. Cumulative effects are considered to be beneficial due to the reduced risk of direct and indirect impacts to rare plants from cross-country motorized use.

Determination of Effects

No sensitive species would be adversely affected by this alternative and all would benefit from the prohibition of cross-country travel.

Alternative 4

Direct and indirect effects of the prohibition of cross-country motorized vehicle travel

Prohibiting cross-country travel would discontinue off-road vehicle use over 1.2 million acres of the Forest; benefits from this prohibition are discussed under Alternative 2.

Direct and indirect effects of adding facilities to the NFTS

None of the 7 miles of unauthorized routes proposed for addition to the NFTS under this alternative are within 100 feet of any sensitive species. There would be no direct or indirect effects on rare plants or their habitats.

There are no proposed routes in SIAs under this alternative.

Cumulative effects

Cumulative effects are the effects of continued motor vehicle use on 1.2 million acres of the KNF, added to the effects of ongoing and reasonably foreseeable management projects on the KNF. Ongoing and reasonably foreseeable activities will all receive pre-project surveys, and mitigation measures will be applied to ensure that viability of plant occurrences is not compromised. Biological Assessments/ Evaluations will be prepared to document any potential effects on TES species. These types of projects have historically had minimal to no effects on TES species and Other Species of Interest due to the application of project design standards, conservation strategies and mitigation measures. Any effects from vegetation management activities would be dwarfed by the beneficial effects of prohibiting cross-country motorized travel on the KNF.

Cumulative effects of road-related activities include the addition of 15 miles of ML 1 roads and 37 miles of ML 2 roads and motorized trails to the NFTS, and removal of 50 miles of road. None of the ongoing or foreseeable actions is within 100 feet of a rare plant site, and none are within SIAs; no negative impacts to rare plants and their habitats from road-related activities are

expected to occur. Cumulative effects are considered to be beneficial due to the reduced risk of direct and indirect impacts to rare plants from cross-country motorized use.

Determination of Effects

No sensitive species would be adversely affected by this alternative and all would benefit from the prohibition of cross-country travel.

Alternative 5

Direct and indirect effects of the prohibition of cross-country motorized vehicle travel

Prohibiting cross-country travel would discontinue off-road vehicle use over 1.2 million acres of the Forest; benefits from this prohibition are discussed under Alternative 2.

Direct and indirect effects of adding facilities to the NFTS

Two sensitive species occur within 30 and 100 feet of dispersed recreation site access routes, totaling 0.4 mile in length. One of the species, *Thermopsis robusta*, tolerates disturbance well. Disturbance affecting about 1.25 acres may actually create habitat or facilitate germination, so effects to this species in both the short and long term are considered to be beneficial. One short route (600 feet) proposed for addition to the NFTS is within 30 feet of a *Meesia uliginosa* site, affecting about ¾ acre. The proposed route is upslope of the fen and past vehicle use has been confined to the route; there has been no disturbance to *Meesia* habitat. The KNF botanist indicates that *Meesia uliginosa* occurrence is not threatened by the proposed route.

There are no direct or indirect effects on rare plants expected from designation of the two areas where off-road motorized use is not prohibited (53 acres total) in the Humbug and Juniper Flat open riding areas.

There are no proposed routes in SIAs under this alternative.

Cumulative effects

Cumulative effects are the effects of continued motor vehicle use on 1.2 million acres of the KNF, added to the effects of ongoing and reasonably foreseeable management projects on the KNF. Ongoing and reasonably foreseeable activities will all receive pre-project surveys, and mitigation measures will be applied to ensure that viability of plant occurrences is not compromised. Biological Assessments/ Evaluations will be prepared to document any potential effects on TES species. These types of projects have historically had minimal to no effects on TES species and Other Species of Interest due to the application of project design standards, conservation strategies and mitigation measures. Any effects from vegetation management activities would be dwarfed by the beneficial effects of prohibiting cross-country motorized travel on the KNF.

Cumulative effects of road-related activities include the addition of 15 miles of ML 1 roads and 99 miles of ML 2 roads and motorized trails, and 53 acres of off-road use areas to the NFTS, and removal of 50 miles of road. None of the ongoing or foreseeable actions is within 100 feet of a rare plant site, and none are within SIAs; no negative impacts to rare plants and their habitats from ongoing or foreseeable road-related activities are expected to occur. Cumulative effects are those described under direct and indirect effects. Cumulative effects are considered to be beneficial due to the reduced risk of direct and indirect impacts to rare plants from cross-country motorized use.

Determination of Effects

No sensitive species would be adversely affected by this alternative and all would benefit from the prohibition of cross-country travel.

Alternative 6

Direct and indirect effects of the prohibition of cross-country motorized vehicle travel

Prohibiting cross-country travel would discontinue off-road vehicle use over 1.2 million acres of the Forest; benefits from this prohibition are discussed under Alternative 2.

Direct and indirect effects of adding facilities to the NFTS

Two sensitive species occur within 30 and 100 feet of dispersed recreation site access routes, totaling 0.4 mile in length. One of the species, *Thermopsis robusta*, tolerates disturbance well. Disturbance affecting about 1.25 acres may actually create habitat or facilitate germination, so effects to this species in both the short and long term are considered to be beneficial. One short route (600 feet) proposed for addition to the NFTS is within 30 feet of a *Meesia uliginosa* site, affecting about ¾ acre. The proposed route is upslope of the fen and past vehicle use has been confined to the route; there has been no disturbance to *Meesia* habitat. The KNF botanist indicates that *Meesia uliginosa* occurrence is not threatened by the proposed route.

There are no direct or indirect effects on rare plants expected from designation of the two areas where off-road use is not prohibited in the Humbug and Juniper Flat open riding areas.

There are no proposed routes in SIAs under this alternative.

Cumulative effects

Cumulative effects are the effects of continued motor vehicle use on 1.2 million acres of the KNF, added to the effects of ongoing and reasonably foreseeable management projects on the KNF. Ongoing and reasonably foreseeable activities will all receive pre-project surveys, and mitigation measures will be applied to ensure that viability of plant occurrences is not compromised.

Biological Assessments/ Evaluations will be prepared to document any potential effects on TES species. These types of projects have historically had minimal to no effects on TES species and Other Species of Interest due to the application of project design standards, conservation strategies and mitigation measures. Any effects from vegetation management activities would be dwarfed by the beneficial effects of prohibiting cross-country motorized travel on the KNF.

Cumulative effects of road-related activities include the addition of 15 miles of ML 1 roads, 89 miles of ML 2 roads and motorized trails, and 53 acres of off-road use areas to the NFTS, and removal of 50 miles of road. None of the ongoing or foreseeable actions is within 100 feet of a rare plant site, and none are within SIAs; no negative impacts to rare plants and their habitats from ongoing or foreseeable road-related activities are expected to occur. Cumulative effects are those described under direct and indirect effects. Cumulative effects are considered to be beneficial due to the reduced risk of direct and indirect impacts to rare plants from cross-country motorized use.

Determination of Effects

No sensitive species would be adversely affected by this alternative and all would benefit from the prohibition of cross-country travel.

Alternative 7

Direct and indirect effects of the prohibition of cross-country motorized vehicle travel

Prohibiting cross-country travel would discontinue off-road vehicle use over 1.2 million acres of the Forest; benefits from this prohibition are discussed under Alternative 2.

Direct and indirect effects of adding facilities to the NFTS

Two sensitive species occur within 30 and 100 feet of dispersed recreation site access routes, totaling 0.4 mile in length. One of the species, *Thermopsis robusta*, tolerates disturbance well. Disturbance affecting about 1.25 acres may actually create habitat or facilitate germination, so effects to this species in both the short and long term are considered to be beneficial. One short route (600 feet) proposed for addition to the NFTS is within 30 feet of a *Meesia uliginosa* site, affecting about ¾ acre. The proposed route is upslope of the fen and past vehicle use has been confined to the route; there has been no disturbance to *Meesia* habitat. The KNF botanist indicates that *Meesia uliginosa* occurrence is not threatened by the proposed route.

There are no direct or indirect effects on rare plants expected from designation of the two areas where off-road motorized use is not prohibited (53 acres total) in the Humbug and Juniper Flat open riding areas.

There are no proposed routes in SIAs under this alternative.

Cumulative Effects

Cumulative effects are the effects of continued motor vehicle use on 1.2 million acres of the KNF, added to the effects of ongoing and reasonably foreseeable management projects on the KNF. Ongoing and reasonably foreseeable activities will all receive pre-project surveys, and mitigation measures will be applied to ensure that viability of plant occurrences is not compromised. Biological Assessments/ Evaluations will be prepared to document any potential effects on TES species. These types of projects have historically had minimal to no effects on TES species and Other Species of Interest due to the application of project design standards, conservation strategies and mitigation measures. Any effects from vegetation management activities would be dwarfed by the beneficial effects of prohibiting cross-country motorized travel on the KNF.

Cumulative effects of road-related activities include the addition of 15 miles of ML 1 roads, 109 miles of ML 2 roads and motorized trails, and 53 acres of off-road use areas to the NFTS, and removal of 50 miles of road. None of the ongoing or foreseeable actions is within 100 feet of a rare plant site, and none are within SIAs; no negative impacts to rare plants and their habitats from ongoing or foreseeable road-related activities are expected to occur. Cumulative effects are those described under direct and indirect effects. Cumulative effects are considered to be beneficial due to the reduced risk of direct and indirect impacts to rare plants from cross-country motorized use.

Determination of Effects

An addendum to the BE was developed to address Alternative 7. No sensitive species would be adversely affected by this alternative and all would benefit from the prohibition of cross-country travel.

Summary of Effects Across All Alternatives

Impacts to rare plants and their habitats vary across all alternatives (Table BR-5). Alternative 1 could have negative effects on rare species and habitats due to the allowance of cross-country travel, which has the potential to affect all but the most inaccessible rare species and habitats. Alternatives 3 and 4 would have completely beneficial effects on rare plants. The other action alternatives propose routes within 30 or 100 feet of known sites, but it has been determined that no adverse impacts would occur from adding these routes to the NFTS. The cumulative effects would be beneficial for all species due to the prohibition of cross-country motorized travel.

Table BR-5. Comparison of botanical resource indicators

Indicators	Alt 1	Alt 2	Alt 3	Alt 4	Alt 5	Alt 6	Alt 7
Acres open for cross-country travel	1.2 million	65	0	0	53	53	53
Miles of unauthorized/ proposed routes within 100 ft of rare plant sites	5.22	0.12	0	0	0.4	0.4	0.4
Acres of rare plant sites within 100 ft of unauthorized/proposed routes	50.55	0.74	0	0	2.0	2.0	2.0
Miles of unauthorized/ proposed routes in SIAs	0.16	0	0	0	0	0	0

Table BR-6. Comparison of effects on botanical resources

Alternative 1	This alternative has the highest potential for negative effects to plants and their habitats due to continued cross-country motorized travel. Plants may be crushed or damaged by tires. Habitat may be degraded or removed through creation of new routes and disturbed areas.
Alternative 2	The prohibition of cross-country motorized travel will eliminate the potential for direct damage to plants by vehicles. No new routes will be created; there will be no loss or degradation of plant habitats due to disturbance by motorized vehicles. Effects of this prohibition will be beneficial to rare plants and their habitats. Designation of 92 miles of unauthorized routes and 65 acres of open riding areas will not adversely affect any threatened, endangered or sensitive plant species or its habitat, or any Botanical Special Interest Area.
Alternative 3	The prohibition of cross-country motorized travel will eliminate the potential for direct damage to plants by vehicles. No new routes will be created; there will be no loss or degradation of plant habitats due to disturbance by motorized vehicles.
Alternative 4	The prohibition of cross-country motorized travel will eliminate the potential for direct damage to plants by vehicles. No new routes will be created; there will be no loss or degradation of plant habitats due to disturbance by motorized vehicles. Effects of this prohibition will be beneficial to rare plants and their habitats. Designation of 7 miles of unauthorized routes will not adversely affect any threatened, endangered or sensitive plant species or its habitat, or any Botanical Special Interest Area.
Alternative 5	The prohibition of cross-country motorized travel will eliminate the potential for direct damage to plants by vehicles. No new routes will be created; there will be no loss or degradation of plant habitats due to disturbance by motorized vehicles. Effects of this prohibition will be beneficial to rare plants and their habitats. Designation of 69 miles of unauthorized routes and 53 acres of open riding areas will not adversely affect any threatened, endangered or sensitive plant species or its habitat, or any Botanical Special Interest Area.
Alternative 6	The prohibition of cross-country motorized travel will eliminate the potential for direct damage to plants by vehicles. No new routes will be created; there will be no loss or degradation of plant habitats due to disturbance by motorized vehicles. Effects of this prohibition will be beneficial to rare plants and their habitats. Designation of 59 miles of unauthorized routes and 53 acres of open riding areas will not adversely affect any threatened, endangered or sensitive plant species or its habitat, or any Botanical Special Interest Area.

Alternative 7	The prohibition of cross-country motorized travel will eliminate the potential for direct damage to plants by vehicles. No new routes will be created; there will be no loss or degradation of plant habitats due to disturbance by motorized vehicles. Effects of this prohibition will be beneficial to rare plants and their habitats. Designation of 74 miles of unauthorized routes and 53 acres of open riding areas will not adversely affect any threatened, endangered or sensitive plant species or its habitat, or any Botanical Special Interest Area.

Compliance with the LRMP and Other Direction

This project was designed to avoid disturbance to sensitive plant species as much as possible. Alternative 1 could adversely affect sensitive plants due to the potential for creation of new unauthorized routes without mitigations. All of the action alternatives include monitoring of sensitive plant occurrences near routes added to the NFTS, and require that site-specific action be taken as needed to maintain viability.

Port-Orford-Cedar

Introduction

Port-Orford-cedar (*Chamaecyparis lawsoniana;* POC) is an ecologically, economically, and socially important tree species with a limited natural range of northwestern California and southwestern Oregon. On the KNF the species occurs on the Happy Camp and Ukonom Ranger Districts. Approximately 5,277 acres of mapped Port-Orford-cedar occur on the Forest, with about 18 million board feet of inventoried volume (USDA/USDI 2003). *Phytophthora lateralis* (PL, or Port-Orford-cedar root disease), a disease that infects and kills Port-Orford-cedar, has spread throughout much of the tree's native range. The disease spreads by the movement of spores in water (down slope), in mud transported from infected sites, or by root-to-root contact (Roth et al. 1987). Roads represent a primary vector for spread from vehicles driving from infested sites into uninfested areas. Management decisions to eliminate cross-county motor vehicle travel, add routes or open riding areas to the National Forest Transportation System (NFTS), or change vehicle type on NFTS roads could affect opportunities for transport of PL, and thus affect POC communities.

Analysis Framework: Statute, Regulation, LRMP, and Other Direction

Direction relevant to the proposed action as it affects Port-Orford-cedar includes:

Klamath National Forest Land and Resource Management Plan (LRMP). The Bureau of Land Management and Forest Service adopted standards and guidelines for the management of habitat for late-successional and old-growth forest related species within the range of the northern spotted owl, commonly known as the Northwest Forest Plan. The language and direction from the Northwest Forest Plan were incorporated into the Klamath LRMP. The LRMP contains the following management direction applicable to motorized travel management and Port-Orford-cedar:

Maintain a healthy and resilient population of all species, including special interest species such as Pacific yew, Brewer spruce, Port-Orford-cedar, Pacific silver fir, Baker cypress and whitebark pine throughout their native range.

21-61 Take measures that shall limit the spread of Port-Orford-cedar root disease, and increase populations of Port-Orford-cedar on the Forest. Prevent or reduce the risk of introducing the disease into uninfested areas. Strategies for reducing the risk to Port-Orford-cedar from infection by the root disease will be integrated into all levels of planning…In order to reduce the spread of Port-Orford-cedar root disease, a risk analysis will be completed for all projects in watersheds containing Port-Orford-cedar. Practices identified from experience, research and the Region 5 – Region 6

Port-Orford-cedar Action Plan will be applied on a site- or drainage specific basis to reduce the spread and severity of the disease.

Effects Analysis Methodology

All roads on the KNF NFTS were evaluated in determining the risk of infection of POC. Mapped sites with POC occurrence were rated for risk of infection with PL according to the following guidelines:

High-risk sites:

Low-lying wet areas with POC (infested or not) that are located 100' or less downslope from already infested areas, or below likely sites for future introductions, especially roads. They include streams, drainage ditches, gullies, swamps, seeps, ponds, lakes, and concave low lying areas where water collects during rainy weather. Dry sites less than 50' below infestations are also considered to be high risk (USDA/USDI 2004).

Low-risk sites:

Sites with characteristics unfavorable for spread and infection by PL (USDA/USDI 2004).

The incidence of new POC infection is associated with (1) distance to the nearest POC; (2) host abundance; and (3) catchment area. Probability figures were based on literature and professional judgment of professionals in the field. GIS layers showing POC populations were overlaid with the NFTS and unauthorized routes to provide an estimate of acres at risk of infestation by PL. Wilderness acres are not included in the analysis figures. Additional information is included in the Klamath National Forest Travel Management Port-Orford-Cedar Analysis, which is incorporated by reference and included in the project files located in the Supervisor's Office in Yreka, California.

Assumptions Specific to the Port-Orford-Cedar Analysis

- A primary method of introducing PL into uninfested watersheds is by transfer of PL-infested mud on the undercarriage, wheels or mud flaps of motorized vehicles.
- POC stands on the KNF located outside of Wilderness may be at risk of becoming infested with PL due to motorized vehicle use.
- Probability of pathogen spread below 6.1% is considered low risk.
- POC stands within wilderness are not considered to be affected by this project, although they could represent an infection source for lands outside of wilderness.
- Cross-country motorized travel off established unauthorized routes (casual use) does not affect the spread of PL.

Data Sources

- GIS layers of unauthorized routes and POC occupied habitat.
- A Range-Wide Assessment of Port-Orford-Cedar (*Chamaecyparis lawsoniana*) on Federal Lands (USDA/USDI 2003).
- Final Supplemental Environmental Impact Statement. Management of Port-Orford-Cedar in Southwest Oregon (USDA/USDI 2004).

Indicators

- Acres of high risk sites outside of wilderness
- Acres of low risk sites outside of wilderness

Methodology by Action

1. Direct and indirect effects of the prohibition of cross-country motorized vehicle travel

Short-term timeframe: 1 year. Short-term effects include immediate effects from changes in travel management that will be evident within the first year of implementation.

Long-term timeframe: 20 years.

Spatial boundary: POC stands on the KNF outside of wilderness.

Indicators: Both indicators were used.

Methodology: GIS analysis of routes and POC sites.

2. Direct and indirect effects of adding facilities to the NFTS

Short-term timeframe: 1 year.

Long-term timeframe: 20 years.

Spatial boundary: POC stands on the KNF outside of wilderness.

Indicators: Both indicators were used.

Methodology: GIS analysis of routes and TES plant sites.

3. Direct and indirect effects of changes to the NFTS

This action involves changing the type of vehicle allowed on existing NFTS roads. There would be no effects to POC from this activity and it is not addressed further in this section.

4. Cumulative effects

Roads are the primary human-related vector for spread of PL. Analysis of cumulative effects for the risk of spread of PL focus on ongoing and foreseeable road-related activities.

Short-term timeframe: not applicable; cumulative effects analysis will be done only for the long-term timeframe.

Long-term timeframe: 20 years.

Spatial boundary: KNF.

Indicators: Both indicators were used.

Methodology: GIS analysis of routes and POC plant sites.

Affected Environment

The distribution of POC on the Klamath National Forest is limited primarily to the Dillon, Clear, and Indian Creek watersheds on the Happy Camp and Ukonom Ranger Districts. Port-Orford-cedar is often a component in mixed conifer stands, generally representing less than 10% of the stand. Stands usually consist of small, isolated pockets or narrow stringers, and are nearly always confined to riparian areas. Most acres fall within the Riparian Reserve land allocation. The current inventory shows 5,277 acres of POC on the forest, of which approximately 2,916 acres are within the Siskiyou Wilderness. Many of the POC stands outside of wilderness are adjacent to NFTS roads built through the canyons, but there is limited motorized access off roads due to steep topography.

Many stands of POC on the Klamath NF are greater than 300 years in age, with some individuals reaching ages of over 700 years. A stand of old POC is located in the 100-acre Sutcliffe Creek Botanical Area in the upper Indian Creek drainage of the Happy Camp Ranger District.

In August, 2006, PL was discovered in cedars along Clear Creek in the Siskiyou Wilderness Area. The extent of the infestation is unknown, but it is believed that PL may have been originally introduced by vehicles driving into Raspberry Lake along an unimproved trail in the 1980s, and the pathogen was carried downstream (Betlejewski, personal communication, 2009). The KNF undertook management actions (rerouting a hiking trail and removal of POC) to reduce the potential for spread of the pathogen outside wilderness. To date Clear Creek is the only infested location on the KNF. All 2,361 acres of POC outside of the Siskiyou Wilderness are considered to be at some risk of infection from PL which could be brought in from other locations off the KNF. About 927 acres in the Clear Creek drainage outside of wilderness are considered to be at high risk of long distance spread and establishment of the pathogen.

Environmental Consequences

Direct effects occur when individual plants are directly impacted by vehicles, such as crushing of seedlings. While this is possible for POC, it is highly unlikely due to the steep terrain in which this species is found. The primary effect on this species from motorized use of unauthorized routes is considered to be the potential for introduction and spread of *P. lateralis*, resulting in infection and eventual death of individual trees. For many years the KNF has implemented wet weather haul restrictions, and project mitigations such as washing of vehicles. Since there are no road-related PL infestations on the KNF, these mitigations have apparently been effective.

Cumulative effects result from the incremental impact of an action when added to the effects of past, present, and reasonably foreseeable future actions. Roads and trails serve as the primary vector for spread of the PL pathogen; however, there are no ongoing or foreseeable projects that involve trail construction. Road-related activities would have the same type of effects as the actions proposed under this project. Effects of these projects would include transfer of the PL pathogen into uninfested areas through road construction and use during wet weather periods. No ongoing or foreseeable projects propose road construction in occupied POC habitats.

Alternative 1

Direct and indirect effects of the prohibition of cross-country motorized vehicle travel

Alternative 1 does not prohibit cross-country travel on the Forest, so 2,361 acres of occupied POC habitat would remain open for off-road use. While casual off-road travel does not seem to affect risk, this alternative would allow creation of new unauthorized routes that could serve as vectors and increase risk of introduction and spread of the PL pathogen. One identified unauthorized route (52-08) within 100’ of a streamside POC population, potentially affecting 4 acres, is currently available for motorized use. Under this alternative, 931 acres of POC habitat are considered to be at high risk of infestation by PL. About 1,430 acres are considered to be at low risk.

Direct and indirect effects of adding facilities to the NFTS

Alternative 1 does not add motorized routes to the NFTS. There would be no effects to POC.

Cumulative effects

There are no ongoing or foreseeable road-related projects proposed within any of the 2,361 acres of POC habitat. Cumulative effects are the same as direct and indirect effects described above.

Alternative 2, 5, and 6

Direct and indirect effects of the prohibition of cross-country motorized vehicle travel

These alternatives all prohibit cross-country travel on the Forest, eliminating the potential for creation of new routes that could serve as vectors for the PL pathogen. About 931 acres of POC habitat are considered to be at high risk of infestation by PL, and 1,430 acres are considered to be at low risk.

Direct and indirect effects of adding facilities to the NFTS

These alternatives all propose addition of a single route (52-08) within 100' of a streamside POC population. This route is about 200' long and accesses a camping site in No Mans Creek (tributary to Clear Creek) just outside the Siskiyou Wilderness. Changing the location of the route is not possible, and removal of currently healthy cedar trees along the route (in order to reduce the potential for infection and spread) is not proposed. Without mitigation, four acres along this route would remain at high risk of spread and establishment of PL, for a total of 931 acres of POC habitat at high risk of infestation by PL.

Cumulative effects

There are no ongoing or foreseeable road-related projects proposed within any of the 2,361 acres of POC habitat. Cumulative effects are the same as direct and indirect effects described above.

Alternatives 3, 4 and 7

Direct and indirect effects of the prohibition of cross-country motorized vehicle travel

These alternatives all prohibit cross-country travel on the Forest. Cross –country motorized travel does not appear to affect risk of introduction and spread of PL. A total of 1,434 acres of occupied POC habitat would be at low risk for introduction and spread of PL, and 927 acres would remain at high risk.

Direct and indirect effects of adding facilities to the NFTS

These alternatives do not propose to add facilities (Alternative 3), or do not propose to add facilities within high risk POC habitats (Alternative 4 and 7). There are no direct or indirect effects associated with this action.

Cumulative Effects

There are no ongoing or foreseeable road-related projects proposed within any of the 2,361 acres of POC habitat. Cumulative effects are the same as direct and indirect effects described above.

Summary of Effects Across All Alternatives

Alternative 1 would have the highest potential for spread of PL due to the potential for creation of new unauthorized routes that could serve as vectors for the PL pathogen. Alternatives 2, 5 and 6 have risk levels similar to Alternative 1. Alternatives 3, 4 and 7 would have the lowest levels of risk.

Table POC-1. Comparison of Port-Orford-cedar indicators

Indicators	Alt 1	Alt 2	Alt 3	Alt 4	Alt 5	Alt 6	Alt 7
Acres of high risk sites	931	931	927	927	931	931	927
Acres of low risk sites	1,430	1,430	1,434	1,434	1,430	1,430	1,434

Compliance with the LRMP and Other Direction

A risk analysis for POC has been completed. Allowing unmanaged cross-country motorized travel that could result in additional unauthorized routes (Alternative 1) is inconsistent with LRMP direction to limit the spread of PL. Alternatives 2, 5 and 6 limit spread of PL through the prohibition of cross-country motorized travel, but would allow 4 acres to remain at high risk due to a single unauthorized route that would be added to the NFTS without mitigation. Alternatives 3, 4 and 7 comply with LRMP direction to limit the spread of PL.

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Non-native Invasive Species

Introduction

Noxious weeds and invasive exotic plants are collectively referred to as noxious or invasive weeds, plants, or species, or simply as weeds. Forest Service policy defines noxious weeds as: "those plant species designated as noxious weeds by the Secretary of Agriculture or by the responsible State official." Noxious weeds generally possess one or more of the following characteristics: aggressive and difficult to manage, poisonous, toxic, parasitic, a carrier or host of serious insects or disease and being non-native or new to or not common to the United States or parts thereof (USDA Forest Service 1995).

Vehicle travel is a major factor/vector in the introduction and spread of invasive plants, so this project affects the population and distribution of these species. Additionally, the former chief of the Forest Service determined that invasive species are one of four significant threats to forests and rangelands. The presence of these invaders affects many other resources, such as soil, wildlife habitat, and sensitive plants, so it is important to analyze and understand the effects of the project on noxious weed populations.

All weed species identified on the Forest are of concern with regard to their potential to spread and threaten native ecosystems. The KNF has prioritized weed infestations for tracking based upon the aggressiveness of the weed species, the degree of regional concern, and feasibility of control. Some species are identified as lower priority for control efforts; they are less often mapped and are not specifically addressed in this analysis (i.e., cheatgrass). While it remains important to prevent the further spread of these species via management activities, control of all known infestations of these lower-priority species is not currently feasible, and they are likely to persist throughout the life of this project. This analysis focuses on the weed species known to occur adjacent to existing and proposed routes relevant to this project.

Analysis Framework: Statute, Regulation, LRMP, and Other Direction

Direction that is relevant to the management and prevention of noxious weeds related to motorized travel management includes:

FSM 2081.03 requires that a weed risk assessment be conducted when any ground disturbing activity is proposed. Projects having moderate to high risk of introducing or spreading noxious weeds must identify noxious weed control measures that must be undertaken during project implementation.

Executive Order 13112 of Feb. 3, 1999 (Fed. Reg. 1999) directs federal agencies to: prevent the introduction of invasive species; detect and respond rapidly to and control such

species; not authorize, fund, or carry out actions that the agency believes are likely to cause or promote the introduction or spread of invasive species unless the agency has determined and made public its determination that the benefits of such actions clearly outweigh the potential harm caused by invasive species; and that all feasible and prudent measures to minimize risk of harm will be taken in conjunction with the actions.

Klamath LRMP Standards and Guidelines for Non-native Plants and Weeds

MA 5-3 [For Late-Successional Reserves (LSRs)] Nonnative species: In general, nonnative species (plant and animal) should not be introduced.

MA 5-77 [For Calochorus persistens Special Habitat] Prohibit any ground disturbance that would adversely affect the known habitat (by introducing weedy species) or physically disturbing existing plants. Disturbed areas near this habitat should be managed to exclude non-native invasive plant species.

MA 16-19 [For Forage Management Area] Activities that favor the establishment of undesirable native and non-native species should be avoided.

Effects Analysis Methodology

This document serves as the weed risk assessment for this project.

The thirty-six species considered in this analysis are listed by the California Department of Food and Agriculture (CDFA 2007) as noxious weeds (Table NNIS-1).

Assumptions Specific to Non-Native Invasive Species Analysis

The following assumptions were used in the analysis of noxious weeds:

- Ground disturbance (soil compaction and displacement, and loss of native vegetation) creates conditions conducive to introduction and establishment of non-native invasive plants.
- Existing weed infestations will continue to spread from untreated sites through motorized vehicle activity.
- Untreated infestations located along routes open to motor vehicle traffic will spread further along the route. Motorized vehicles will bring in weed seeds and propagative parts from other areas.
- All types of vehicles with a variety of tire types (from passenger car tires to heavily lugged, off-highway pickup truck tires) are currently using ML2 and ML3 roads. There is no evidence that vehicle type affects seed vectoring; therefore, establishing mixed use on some ML 3 roads will not affect weed spread.

- Seasonal restrictions will have negligible effect on weed dispersal and spread since primary use will occur during the growing season.
- Weeds can spread up to 100 feet from motorized routes. This value includes the distance that vehicles are allowed to drive off roads for parking and camping (30') and a generous distance allowance for seed dispersal.
- Weed prevention measures will continue to be implemented for other ground disturbing activities.
- Ongoing weed treatment activities on the KNF will continue into the future. Newly-discovered high risk weed sites will be prioritized for treatment as they are identified.
- Increased use has the potential to increase the risk of noxious weed introduction and spread.
- Use of newly designated roads and trails will not increase perceptibly in the future.
- All road construction activities are considered to be high risk for introduction and spread of noxious weeds. Because routes are already established, the risk of introduction of noxious weeds from designating unauthorized routes will have a lower risk than road construction.
- Weed sites are mapped as polygons. The minimum polygon size is 0.1 acre.
- Not all polygon acres are adjacent to routes; however, due to mapping limitations, exact acres within 100' of routes could not be determined. Therefore, the entire polygon acreage was used, which overstates the amount of effect.

Data Sources

- GIS layers with routes and locations of noxious weed populations.
- Information from field visits.
- Marla Knight, Forest Service botanist (20 years experience working with noxious weeds on the KNF), December 2008-May 2009.

Indicators

Risk of weed spread is related to the proximity of the road (vector) to a weed occurrence, the size of that occurrence, whether the occurrence is being actively treated, and the efficacy of the treatment. The following indicators were selected to address these factors. The level of risk of weed spread (indicator #4) is informed by the treatment history that has occurred on that site.

- Number of unauthorized/proposed routes within 100 ft. of known noxious weed sites
- Miles of unauthorized/proposed routes within 100 ft. of known noxious weed sites
- Acres of noxious weed sites within 100 ft. of unauthorized or proposed routes
- Number of unauthorized routes assigned "high risk" of noxious weed introduction or spread

- All indicators were used for all actions.

Methodology by Action

The following methodology was completed for all actions.

GIS layers of weed sites were compared with layers showing locations of unauthorized routes. Each route was assigned a risk level indicating the risk for noxious weed spread or introduction and the effectiveness of treatment. Risk levels were assigned based on the following factors:

High: A-rated species (California Department of Agriculture) or high priority ranked species (KNF) occurs within 100 feet of unauthorized or proposed routes, and no treatment is occurring or treatment is ineffective.

Medium: Known populations of B- or C-rated species (California Department of Agriculture) occur within 100 feet of unauthorized or proposed routes

Low: Noxious weed populations were not present within 100 feet of unauthorized routes, or weed species has a low priority ranking on the KNF.

A full discussion of the weed ratings is documented in the Klamath National Forest Noxious Weed List found in the project files located in the KNF Supervisor's Office in Yreka, CA.

GIS weed polygons were used to calculate the number of acres of weeds within 100' of unauthorized routes. If a weed occurrence was mapped but did not have a polygon, it was assumed to be 0.1 acre in size.

1. Direct and indirect effects of the prohibition of cross-country motorized vehicle travel

Short-term timeframe: There are no short term effects from prohibiting cross-country motorized travel. Unauthorized routes exist, and are creating effects on the landscape. Recovery and revegetation of unauthorized routes and other vehicle-caused disturbances will take time (20+ years).

Long-term timeframe: 20 years

Spatial boundary: Listed under each alternative.

Methodology: GIS analysis and risk assessment.

2. Direct and indirect effects of adding facilities to the NFTS

Short-term timeframe: 1 year. In the short term, there would be virtually no effects from adding routes or areas to the NFTS. Unauthorized routes exist on the ground and are currently being

used, so the potential for introduction and spread of noxious weeds will not change in the short term.

Long-term timeframe: 20 years.

Spatial boundary: Listed under each alternative.

Methodology: GIS analysis and risk assessment.

3. Direct and indirect effects of changes to the NFTS

This activity includes changing vehicle class on existing NFTS roads. Proposals for mixed use were not analyzed for impacts from non-native invasive species because it was assumed that adding mixed use mileage to the NFTS would have no effect on seed vectoring. This activity will not be addressed further in this section.

4. Cumulative effects

Short-term timeframe: Not applicable; cumulative effects analysis will be done only for the long-term time frame.

Long-term timeframe: 20 years.

Spatial boundary: Listed under each alternative.

Methodology: GIS analysis and risk assessment.

Introduction and spread of noxious weeds on the Klamath National Forest occurs primarily along roads and rivers. Timber harvest, thinning, fuel reduction, and other management activities have created disturbed sites, but weed sites have been identified primarily along the access roads, not within the management units. Therefore, the cumulative effects analysis for noxious weeds considers only the effects of this project added to all ongoing and foreseeable road-related actions.

Affected Environment

Thirty-six invasive plant species are of management concern for the Klamath National Forest (Table NNIS-1). These weed species, which are known from about 996 locations, occupy about 8,675 acres.

Table NNIS-7. Klamath National Forest noxious weed list

Scientific Name	Common Name(s)	KNF Priority	CDFA Rating	Risk Rating
Acroptilon repens	Russian knapweed	H	B	H
Ailanthus altissima	Tree of Heaven	M	C	L
Bromus tectorum	Cheat grass	L	None	L
Cardaria draba	Whitetop	M	B	L
Cardaria chalapensis	Lens-podded whitetop	M	B	L
Carduus nutans L.	Musk thistle	H	A	H
Carduus pycnocephalus	Italian thistle	H	C	H
Centaurea diffusa Lam.	Diffuse knapweed	H	A	H
Centaurea maculosa	Spotted knapweed	H	A	H
Centaurea debeauxii	Meadow knapweed	H	A	H
Centaurea solstitialis L.	Yellow starthistle	M	C	H - treated only in high priority areas
Centaurea squarrosa	Squarrose knapweed	H	A	H
Chondrilla juncea	Rush skeleton weed	H	A	H
Cirsium arvense	Canada thistle	M	B	M
Cirsium vulgare	Bull thistle	L	C	L
Conium maculatum	Poison hemlock	L	None	L
Cynoglossum officinale	Houndstongue	H	None	H
Cytisus scoparius	Scotch broom	H	C	H
Euphorbia esula L.	Leafy spurge	H	A	H
Genista monspessulana	French broom	H	C	H
Hypericum perforatum L.	Klamath weed	L	C	L
Isatis tinctoria L.	Dyer's woad, Marlahan mustard	M	B	H
Lepidium latifolium	Perennial pepperweed	H	B	H
Linaria dalmatica	Dalmation toadflax		A	H
Lythrum salicaria L.	Purple loosestrife	H	B	H
Melilotus spp.	White sweetclover	L	None	L
Onopordum acanthium	Scotch thistle	H	A	H
Onopordum tauricum	Taurian thistle	H	A	H
Polygonum cuspidatum Sieb. & Zucc.	Japanese knotweed	H	B	H - Not found on KNF
Potentilla recta	Sulphur cinquefoil	H	None	H
Rubus discolor	Himalayan blackberry	L	None	L
Salvia aethiopis	Mediterranean sage	H	B	H
Sonchus arvensis	Perennial sow-thistle	H	A	H
Spartium junceum	Spanish broom	H	C	H
Taenaiatherum caputmedusae	Medusahead	L	C	L
Tribulus terrestris	Puncture vine	H	C	H

The two primary vectors for weed spread are roads and rivers. Most weed infestations on the KNF are concentrated along established roads (especially heavily traveled routes such as state highways and major connector roads) or river banks and gravel bars. There are more than 4,500 miles of NFTS road on the KNF, about 3,700 miles of which are open to the public for motorized use. Any of these roads can serve as a vector for seed spread.

Motorized cross-country vehicle travel has been occurring on the KNF for many years. This activity has created routes that are repeatedly used, creating de facto "roads" and increasing the vulnerability of the landscape to noxious weed invasion and spread. A large portion of the KNF is free of noxious weeds, which indicates that casual motorized use off existing roads (i.e. one or two vehicle passes) is not a major contributor to weed spread (Knight, personal communication).

The lower elevations on the Forest and the mid-elevation valleys contain many of the noxious weed concentrations. These areas contain a large proportion of privately-owned lands, and major state or county roads which are heavily-used entry points or "seed sources" for weeds moving into the less-invaded parts of the Forest.

NFTS roads are checked regularly for weed sites; new sites are identified, mapped, and prioritized for treatment. The KNF has supported an active manual weed treatment program for 10 years. Treatment priorities are based on species, location of infestation, other resources at risk, and feasibility of treatment. Treated sites are considered to have a risk of spread ranging from zero to moderate (which may differ from the overall risk rating for the species). Treatment significantly reduces the risk of spread because (1) annual seed production is removed with the plants; (2) the seed bank declines each year; and (3) the potential for seeds or seeding plant parts to be dispersed by motorized vehicles is reduced. Some widespread species such as cheatgrass or star thistle cannot be effectively treated on a large scale, but are treated at high priority locations (such as wilderness trailheads) to reduce the risk of spread into protected and weed-free areas.

Infestations of 14 weed species have been found within 100 feet of 41 unauthorized routes (Table NNIS-2). There are 54 identified infestations; some routes support more than one species. Twenty-six populations are being treated, or have been treated in the past. Effectiveness of treatment (ranging from moderate to 100% success) influences the risk of spread for that population. Most treated sites show zero to low risk of spread.

Risk of spread may also be affected by the weed location. For example, numerous weed populations occur on main access routes such as Highway 97, and are within 100' of the takeoff point of an unauthorized route, but are not located on the route itself. Several infestations are located on the opposite side of the main access route, in one case on the other side of a fence which prohibits vehicle traffic. Six treated knapweed sites are on river bars where vehicle traffic is prohibited, but lie within 100' of the end of the proposed route. *Hypericum perforatum* has a biocontrol agent that has been determined to be effective in preventing spread. In all of these

cases, the risk of spread is considered to be low or moderate. A complete list of routes with associated risk ratings and justification for the rating is included in the project record located in the KNF Supervisor's Office in Yreka, CA.

Table NNIS-2. Alternative 1: Unauthorized routes within 100 feet of known weed sites.

Scientific Name	Common name	# of Routes	KNF Priority	Miles in Routes *	Acres of weeds	# Sites with High Risk of Spread
Acroptilon repens	Russian knapweed	1	H	7.00	0.32	0
Cardaria chalapensis	Lens-podded whitetop	1	M	0.09	0.10	1
Centaurea debeauxii	Meadow knapweed	2	H	0.13	0.20	0
Centaurea maculosa	Spotted knapweed	7	H	1.84	2.05	0
Centaurea solstitialis	Yellow starthistle	12	M	2.81	6.50	8
Centaurea squarrosa	Squarrose knapweed	4	H	1.54	0.20	0
Cirsium arvense	Canada thistle	1	M	0.91	6.80	0
Cytisus scoparius	Scotch broom	4	M	1.92	0.40	0
Hypericum perforatum	Klamath weed	5	L	3.88	4.25	0
Isatis tinctoria	Dyer's woad	8	M	1.24	5.80	4
Lepidium latifolium	Perennial pepperweed	3	H	2.53	4.25	3
Linaria dalmatica	Dalmation toadflax	3	H	0.97	11.36	0
Onopordum acanthium	Scotch thistle	2	H	2.42	0.30	0
Potentilla recta.	Sulphur cinquefoil	1	H	0.09	0.10	0
Total # of unauthorized routes with weeds		**41****				**16**
Total miles / Acres				**28.76****	**42.63**	

* Total miles in route exposed to weed spread - not all miles of route are within 100' of weed infestation.
**Some routes have more than one weed. Number of routes and mileage were only counted once.

Environmental Consequences

Areas of soil disturbance or displacement are especially vulnerable to weed invasion. Motorized vehicles are efficient at both creating soil disturbance, and carrying weed seeds and other propagules to new locations (Ouren et al. 2007, Von der Lippe and Kowarik 2007).

Alternative 1

Direct and indirect effects of the prohibition on cross-country motorized vehicle travel

This alternative does not prohibit cross-country motor vehicle travel. In the long term, noxious weed sites along 41 unauthorized routes would continue to be accessible by motorized vehicles, although treatment of 26 sites will mitigate risk of spread for those routes. There would continue to be a high risk that weeds would spread along 13 routes in both the short and long term (3 routes have populations of 2 different weeds - Table NNIS-1). In addition, is a risk of introduction and spread of weeds remains for the other 409 miles of unauthorized routes that are currently uninfested. Motor vehicles could continue to create areas of disturbance that would be vulnerable to weed invasion on the 1.2 million acres that are open for off-road travel. Any new unauthorized routes would establish new vectors for weed propagules to travel into and across the Forest, and whatever weeds were carried into the Forest would find amenable (disturbed) habitat. Under this alternative, all but the most inaccessible habitats would be at risk of noxious weed invasion and spread from cross-country motor vehicle travel.

Direct and indirect effects of adding facilities to the NFTS

There would be no additions of facilities under this alternative. There will be no direct or indirect effects.

Cumulative effects

The cumulative effects are the combined effects of cross-country motor vehicle travel on 1.2 million acres (497 miles of established routes) and ongoing and foreseeable road-related actions (addition of 13 miles of ML 1 road and 26 miles of ML 2 road to the NFTS, and removal of 50 miles of ML2 road from the NFTS - 48 miles through decommissioning and 2 miles through conversion to a hiking trail). The effects of unmanaged cross-country motor vehicle travel are addressed above. Ongoing and reasonably foreseeable road-related actions will have separate noxious weed evaluations, and appropriate mitigations will be applied to minimize noxious weed introduction and spread. Mitigations could include such activities as pre-project weed surveys, flagging and avoiding noxious weed occurrences, washing vehicles and equipment prior to entering the Forest, using weed-free materials, minimizing ground disturbance, and restoring disturbed sites with native materials. Implementation of the National Strategy and Implementation Plan for Invasive Species Management (USDA Forest Service 2004) minimizes the risk of noxious weed introduction and spread associated with future road-related actions.

In the short term, surface disturbance on 48 miles of decommissioned roads will provide opportunity for establishment of noxious weeds; however, prohibition of vehicles will remove a mechanism for seed dispersal. Removal of motor vehicles from the 2 miles of road converted into a hiking trail will reduce the potential for weed spread on that road. In the long term,

decommissioned roads should return to native vegetation and the risk of noxious weed introduction and spread should be minimal.

Overall, effects of ongoing and foreseeable activities are overshadowed by the potential for introduction and spread of weeds by unmanaged motorized use of the KNF.

Alternative 2

Direct and indirect effects of the prohibition on cross-country motorized vehicle travel

In the short term, closure of 1.2 million acres to motorized use would eliminate soil disturbance caused by motorized vehicles on any of the acres that are open for cross-country travel. The prohibition of motorized vehicles eliminates the potential for creation of new unauthorized routes, removing an effective vector for weed spread, which should reduce both the risk of introduction of noxious weeds and the rate of spread of weeds on infested unauthorized routes. Removal of cross-country travel would result in decompaction of the soil and eventual revegetation with native perennial grasses and forbs. This could eventually result in late-seral (late-stage ecological succession) native vegetation, which is better able to resist weed invasion (Gelbard and Harrison 2005). The amount of ground disturbed by motor vehicles would remain static in the short term, but no new routes would be created. In the long term, disturbed sites (including 345 miles of unauthorized routes) will slowly recover and revegetate, so the amount of disturbed ground susceptible to introduction and spread of noxious weeds would decrease. Threats to native vegetation and wildlife habitat from establishment of weeds would be reduced or eliminated over much of the National Forest. Effects of this action are considered to be wholly beneficial.

Direct and indirect effects of adding facilities to the NFTS

This alternative would allow continued motorized use of 22 routes that are currently located within 100’ of noxious weed sites (about 12.4 acres - Table NNIS-3). All routes except one are short spurs that lead to dispersed recreation sites. In the short and long terms, there is a high risk of spread from 12 noxious weed populations along 9 of these routes. Most of the threat comes from starthistle populations that cannot be effectively treated.

Table NNIS-3. Alternative 2: Unauthorized routes within 100 feet of known weed sites.

Scientific Name	Common name	Routes	Total Miles of Routes*	Total Acres	# Sites with High Risk of Spread
Centaurea debeauxii	Meadow knapweed	52-12 52-13	0.13	0.20	Moderate Moderate
Centaurea maculosa	Spotted knapweed	54-07 54-08 54-10 54-11 54-12 54-17 55-18	1.84	1.95	None None None None None None None
Centaurea solstitialis	Yellow starthistle	51-05 51-25 51-26 51-33 52-04 52-12 54-17 54-46a 54-47 54-48	1.81	6.14	High Moderate Moderate High High High High High High High
Centaurea squarrosa	Squarrose knapweed	7H002.2	0.16	0.16	Low
Cytisus scoparius	Scotch broom	52-04 55-13 55-14	1.38	2.01	Low Low Low
Isatis tinctoria.	Dyer's woad	51-05 51-25 51-26 51-33 52-12 55-26 55-28	1.14	1.96	High Moderate Moderate High High Low High
Totals		**22****	**5.29****	**12.42**	
# of Sites with High Risk of Spread					**12**

* Total miles in route exposed to weed spread - not all miles of route are within 100' of weed infestation.
**Some routes have more than one weed. Number of routes and mileage were only counted once.

About 87 miles of proposed routes do not currently support weeds. Once added to the NFTS, these routes will be assessed for presence of weeds and need for treatment along with the rest of the roads on the transportation system. High risk sites will be prioritized and treated as funding and personnel become available.

Lands within designated open riding areas will be subjected to soil displacement, and much of the acreage will be inhospitable to weeds. Loading and parking sites are the areas that have highest risk for weed introduction. Those sites will be assessed for weeds and treated as appropriate. Juniper Flat is located adjacent to a state highway and the Humbug area is located on

a heavily used County road. Even if weed infestations are treated, reintroduction of weeds into these areas is highly probable.

Cumulative effects

This alternative combined with ongoing and foreseeable road-related activities will result in 131 miles of roads and motorized trails added to the NFTS, and 50 miles of road being decommissioned. All routes added to the NFTS will have weed assessments and appropriate mitigation measures to address noxious weeds (see discussion under Alternative 1). All routes added to the NFTS will be assessed for weed presence, and treatment will be conducted as appropriate.

In the short term, surface disturbance on 48 miles of decommissioned roads will provide opportunity for establishment of noxious weeds; however, prohibition of vehicles will remove a mechanism for seed dispersal. Removal of motor vehicles from the 2 miles of road converted into a hiking trail will reduce the potential for weed spread down that road. In the long term, decommissioned roads should return to native vegetation and the risk of noxious weed introduction and spread should be minimal. Effects of all proposed road-related actions are overshadowed by the beneficial effects of reducing risk of introduction and spread of weeds by eliminating unmanaged motorized use from 405 miles of unauthorized routes and 1.2 million acres.

Alternative 3

Direct and indirect effects of the prohibition on cross-country motorized vehicle travel

Direct and indirect effects are the same as described for Alternative 2, with the exception that motorized use would be removed from 497 miles of unauthorized routes. All weed sites will remain in existence, but the potential for creation of unauthorized routes (a major vector for spread) will be removed so the risk of spread will be substantially reduced. Treatment will continue on sites that are currently part of the KNF treatment program. Effects are considered to be beneficial.

Direct and indirect effects of adding facilities to the NFTS

There would be no additions of facilities under this alternative. There will be no direct or indirect effects.

Cumulative effects

This alternative does not propose any additions to the NFTS; cumulative effects are limited to the direct and indirect effects of the prohibition of cross-country travel added to those of ongoing and

foreseeable road-related activities. The effects of the prohibition of cross-country travel are described under Alternative 2.

This alternative combined with ongoing and foreseeable road-related activities will result in adding 13 miles of ML1 road and 26 miles of ML2 road to the NFTS, and removal of 50 miles (48 miles through decommissioning and 2 miles through conversion to a non-motorized trail). All routes added to the NFTS will have weed assessments and appropriate mitigation measures to address noxious weeds (see discussion under Alternative 1). The potential for weed introduction and spread along all routes being added to the NFTS is considered to be high. However, these roads will be monitored for weed presence, and treatment will be conducted as appropriate.

In the short term, surface disturbance on 48 miles of decommissioned roads will provide opportunity for establishment of noxious weeds; however, prohibition of vehicles will remove a mechanism for seed dispersal. Removal of motor vehicles from the 2 miles of road converted into a hiking trail will reduce the potential for weed spread down that road. In the long term, decommissioned roads should return to native vegetation and the risk of noxious weed introduction and spread should be minimal. Cumulative effects are considered to be beneficial.

Alternative 4

Direct and indirect effects of the prohibition on cross-country motorized vehicle travel

Direct and indirect effects are the same as described for Alternative 2.

Direct and indirect effects of adding facilities to the NFTS

Alternative 4 proposes to add one route (0.04 mile in length) within 100’ of one occurrence of a dyer’s woad population (0.4 acres). This occurrence is part of the KNF treatment program. Treatment effectiveness has been high, so the risk of spread is considered to be low.

All but one routee, proposed for addition to the NFTS are weed-free. Once added to the NFTS, these routes (about 7 miles) will be assessed for presence of weeds and need for treatment along with the rest of the roads in the system. High risk sites will be prioritized and treated as funding and personnel become available.

Cumulative effects

This alternative proposes to add 7 miles of routes to the NFTS, one of which is within 100’ of a noxious weed occurrence. This alternative combined with ongoing and foreseeable road-related activities will result in adding 13 miles of ML1 road and 33 miles of open road to the NFTS, and removal of 50 miles (48 miles through decommissioning and 2 miles through conversion to a non-motorized trail). All routes added to the NFTS will have weed assessments and appropriate mitigation measures to address noxious weeds (see discussion under Alternative 1). All routes

added to the NFTS will be assessed for weed presence, and treatment will be conducted as appropriate.

In the short term, surface disturbance on 48 miles of decommissioned roads will provide opportunity for establishment of noxious weeds; however, prohibition of vehicles will remove a mechanism for seed dispersal. Removal of motor vehicles from the 2 miles of road converted into a hiking trail will reduce the potential for weed spread down that road. In the long term, decommissioned roads should return to native vegetation and the risk of noxious weed introduction and spread should be minimal. Effects of all proposed road-related actions are overshadowed by the beneficial effects of reducing risk of introduction and spread of weeds by eliminating unmanaged motorized use from 490 miles of unauthorized routes and 1.2 million acres.

Alternative 5

Direct and indirect effects of the prohibition on cross-country motorized vehicle travel

Direct and indirect effects are the same as described for Alternative 2.

Direct and indirect effects of adding facilities to the NFTS

Alternative 5 would add 27 routes (5.36 miles) that are within 100' of 31 noxious weed occurrences (12.5 acres - Table NNIS-4). All routes except one are short spurs that lead to dispersed recreation sites. In the short and long terms, there is a high risk of spread from 12 noxious weed populations along 9 of these routes. Most of the threat comes from starthistle populations that cannot be effectively treated.

Table NNIS-4. Alternative 5: Unauthorized routes within 100 feet of known weed sites.

Scientific Name	Common name	Routes	Total Miles of Routes*	Total Acres	Risk of Spread
Centaurea debeauxii	Meadow knapweed	52-12 52-13	0.13	0.20	Moderate Moderate
Centaurea maculosa	Spotted knapweed	54-07 54-08 54-10 54-11 54-12 54-17 55-18	1.84	1.95	None None None None None None None

Scientific Name	Common name	Routes	Total Miles of Routes*	Total Acres	Risk of Spread
Centaurea solstitialis	Yellow starthistle	51-05 51-25 51-26 51-33 52-04 52-12 54-17 54-46a 54-47 54-48	1.96	6.14	High Moderate Moderate High High High High High High High
Centaurea squarrosa	Squarrose knapweed	7H002.2	0.16	0.16	Low
Cytisus scoparius	Scotch broom	52-04 52-05a 55-13 55-14	1.92	2.11	Low Low Low Low
Isatis tinctoria	Dyer's woad	51-05 51-25 51-26 51-33 52-12 55-26 55-28	1.12	1.96	High Moderate Moderate High High Low High
Totals		**27****	**5.36****	**12.52**	
# of Sites with High Risk of Spread					**12**

* Total miles in route exposed to weed spread - not all miles of route are within 100' of weed infestation.
**Some routes have more than one weed. Number of routes and mileage were only counted once.

About 64 miles of proposed routes do not currently support weeds. Once added to the NFTS, these routes will be assessed for presence of weeds and need for treatment along with the rest of the roads in the system. High risk sites will be prioritized and treated as funding and personnel become available.

The effects of adding 2 open riding areas are described under Alternative 2.

Cumulative Effects

This alternative combined with ongoing and foreseeable road-related activities will result in 108 miles of roads and motorized trails added to the NFTS, and 50 miles of road being removed (48 decommissioned and 2 converted to a non-motorized trail). All routes added to the NFTS will have weed assessments and appropriate mitigation measures to address noxious weeds (see discussion under Alternative 1). All routes added to the NFTS will be assessed for weed presence, and treatment will be conducted as appropriate.

In the short term, surface disturbance on 48 miles of decommissioned roads will provide opportunity for establishment of noxious weeds; however, prohibition of vehicles will remove a mechanism for seed dispersal. Removal of motor vehicles from the 2 miles of road converted into

a hiking trail will reduce the potential for weed spread down that road. In the long term, decommissioned roads should return to native vegetation and the risk of noxious weed introduction and spread should be minimal. Effects of all proposed road-related actions are overshadowed by the beneficial effects of reducing risk of introduction and spread of weeds by eliminating unmanaged motorized use from 428 miles of unauthorized routes and 1.2 million acres.

Alternative 6

Direct and indirect effects of the prohibition on cross-country motorized vehicle travel

Direct and indirect effects are the same as described for Alternative 2.

Direct and indirect effects of adding facilities to the NFTS

Alternative 6 would add 24 routes (5.3 miles) that are within 100' of noxious weed occurrences (12.4 acres - Table NNIS-5). All routes except one are short spurs that lead to dispersed recreation sites. In the short and long terms, there is a high risk of spread from 12 noxious weed populations along 9 of these routes. Most of the threat comes from starthistle populations that cannot be effectively treated.

Table NNIS-5. Weeds within 100 feet of proposed routes under Alternative 6

Scientific Name	Common name	Routes	Total Miles of Routes*	Acres	Risk of Spread
Centaurea debeauxii	Meadow knapweed	52-12 52-13	0.13	0.20	Moderate Moderate
Centaurea maculosa	Spotted knapweed	54-07 54-08 54-10 54-11 54-12 54-17 55-18	1.84	1.95	None None None None None None None
Centaurea solstitialis	Yellow starthistle	51-05 51-25 51-26 51-33 52-04 52-12 54-17 54-46a 54-47 54-48	1.96	6.14	High Moderate Moderate High High High High High High High
Centaurea squarrosa	Squarrose knapweed	7H002.2	0.16	0.16	Low
Cytisus scoparius	Scotch broom	52-04 55-13 55-14	1.38	2.01	Low Low Low

Scientific Name	Common name	Routes	Total Miles of Routes*	Acres	Risk of Spread
Isatis tinctoria	Dyer's woad	51-05 51-25 51-26 51-33 52-12 55-26 55-28	1.12	1.96	High Moderate Moderate High High Low High
Totals		**24****	**5.30****	**12.42**	
# of Sites with High Risk of Spread					**12**

* Total miles in route exposed to weed spread - not all miles of route are within 100' of weed infestation.
**Some routes have more than one weed. Number of routes and mileage were only counted once.

About 54 miles of proposed routes do not currently support weeds. Once added to the NFTS, these routes will be assessed for presence of weeds and need for treatment along with the rest of the roads in the system. High risk sites will be prioritized and treated as funding and personnel become available.

The effects of adding 2 open riding areas are described under Alternative 2.

Cumulative Effects

This alternative combined with ongoing and foreseeable road-related activities will result in 98 miles of roads and motorized trails added to the NFTS, and 50 miles of road being removed (48 decommissioned and 2 converted to a non-motorized trail). All routes added to the NFTS will have weed assessments and appropriate mitigation measures to address noxious weeds (see discussion under Alternative 1). All routes added to the NFTS will be assessed for weed presence, and treatment will be conducted as appropriate.

In the short term, surface disturbance on 48 miles of decommissioned roads will provide opportunity for establishment of noxious weeds; however, prohibition of vehicles will remove a mechanism for seed dispersal. Removal of motor vehicles from the 2 miles of road converted into a hiking trail will reduce the potential for weed spread down that road. In the long term, decommissioned roads should return to native vegetation and the risk of noxious weed introduction and spread should be minimal. Effects of all proposed road-related actions are overshadowed by the beneficial effects of reducing risk of introduction and spread of weeds by eliminating unmanaged motorized use from 438 miles of unauthorized routes and 1.2 million acres.

Alternative 7

Direct and indirect effects of the prohibition on cross-country motorized vehicle travel

Direct and indirect effects are the same as described for Alternative 2.

Direct and indirect effects of adding facilities to the NFTS

Alternative 7 would add 24 routes (5.56 miles) that are within 100' of noxious weed occurrences 12.1 acres – Table NNIS-6). All routes except one are short spurs that lead to dispersed recreation sites. In the short and long terms, there is a high risk of spread from 12 noxious weed populations along 9 of these routes. Most of the threat comes from starthistle populations that cannot be effectively treated.

Table NNIS-6. Weeds within 100 feet of proposed routes under Alternative 7

Scientific Name	Common name	Routes	Total Miles of Routes*	Total Acres	Risk of Spread
Centaurea debeauxii	Meadow knapweed	52-12 52-13	0.13	0.20	Moderate Moderate
Centaurea maculosa	Spotted knapweed	54-08 54-10 54-11 54-12 54-17 55-18	1.40	1.95	None None None None None None
Centaurea solstitialis	Yellow starthistle	51-05 51-25 51-26 51-33 52-04 52-12 54-17 54-46a 54-47 54-48	1.96	6.14	High Moderate Moderate High High High High High High High
Centaurea squarrosa	Squarrose knapweed	7H002.2	0.16	0.16	Low
Cytisus scoparius	Scotch broom	52-04 52-05a 55-13 55-14	1.92	2.11	Low Low Low Low
Isatis tinctoria	Dyer's woad	51-05 51-25 51-33 52-12 55-26 55-28	0.92	1.55	High Moderate High High Low High
Totals		**24****	**5.56****	**12.11**	
# of Sites with High Risk of Spread					**12**

* Total miles in route exposed to weed spread - not all miles of route are within 100' of weed infestation.
**Some routes have more than one weed. Number of routes and mileage were only counted once.

About 69 miles of proposed routes do not currently support weeds. Once added to the NFTS, these routes will be assessed for presence of weeds and need for treatment along with the rest of the roads in the system. High risk sites will be prioritized and treated as funding and personnel become available.

The effects of adding 2 open riding areas are described under Alternative 2.

Cumulative Effects

This alternative combined with ongoing and foreseeable road-related activities will result in 113 miles of roads and motorized trails added to the NFTS, and 50 miles of road being removed (48 decommissioned and 2 converted to a non-motorized trail). All routes added to the NFTS will have weed assessments and appropriate mitigation measures to address noxious weeds (see discussion under Alternative 1). All routes added to the NFTS will be assessed for weed presence, and treatment will be conducted as appropriate.

In the short term, surface disturbance on 48 miles of decommissioned roads will provide opportunity for establishment of noxious weeds; however, prohibition of vehicles will remove a mechanism for seed dispersal. Removal of motor vehicles from the 2 miles of road converted into a hiking trail will reduce the potential for weed spread down that road. In the long term, decommissioned roads should return to native vegetation and the risk of noxious weed introduction and spread should be minimal. Effects of all proposed road-related actions are overshadowed by the beneficial effects of reducing risk of introduction and spread of weeds by eliminating unmanaged motorized use from 405 miles of unauthorized routes and 1.2 million acres.

Summary of Effects Across All Alternatives

The risk of introduction and spread of noxious weeds is highest for Alternative 1, due to the continued availability of 1.2 million acres for cross-country motorized travel and the inevitable establishment of new motorized routes which provide for effective seed spread. Alternative 3 restricts motorized use the most and, therefore, has the least potential for noxious weed introduction and spread. There would be a high risk of noxious weed introduction and spread along some routes added to the NFTS under Alternatives 2, 5, 6 and 7, primarily associated with starthistle populations and several populations of dyer's woad that are not currently being treated.

Table NNIS-7. Comparison of alternatives

Indicator	Alt. 1	Alt. 2	Alt. 3	Alt. 4	Alt. 5	Alt. 6	Alt 7
Number of unauthorized/proposed routes within 100 ft of known weed sites	41	22	0	1	27	24	24
Miles of unauthorized/proposed routes within 100 ft of known weed sites	28.76	5.29	0	0.04	5.36	5.30	5.56
Acres of weed sites within 100 ft of unauthorized/proposed routes	42.63	12.42	0	0.04	12.52	12.42	12.11
Number of weed sites with high risk of spread	16	12	0	0	12	12	12

Table NNIS-8. Comparison of effects on non-native invasive species

Alternative 1	This alternative has the highest potential for introduction and spread of non-native plant species. While casual cross-country motorized travel does not appear to be a significant mechanism for spread, there is high potential for establishment of new unauthorized routes that could then serve as vectors for seed dispersal; 16 weed-infested sites will remain at high risk of spread.
Alternative 2	The prohibition of cross-country motorized travel will eliminate the potential for creation of new vectors for spread of non-native plants; 92 miles of unauthorized routes (87 miles of which are weed-free) and 65 acres of open riding areas will be assessed for weeds and newly-discovered sites will be treated. 12 weed-infested sites will remain at high risk of spread.
Alternative 3	The prohibition of cross-country motorized travel will eliminate the potential for creation of new vectors for spread of non-native plants. This alternative has the lowest potential for establishment and spread of non-native plants.
Alternative 4	The prohibition of cross-country motorized travel will eliminate the potential for creation of new vectors for spread of non-native plants; 7 miles of unauthorized routes (6.9 miles of which are weed-free) will be assessed for weeds and newly-discovered sites will be treated. 1 weed-infested site will remain at high risk of spread.
Alternative 5	The prohibition of cross-country motorized travel will eliminate the potential for creation of new vectors for spread of non-native plants; 69 miles of unauthorized routes (64 miles of which are weed-free) and 53 acres of open riding areas will be assessed for weeds and newly-discovered sites will be treated. 12 weed-infested sites will remain at high risk of spread.
Alternative 6	The prohibition of cross-country motorized travel will eliminate the potential for creation of new vectors for spread of non-native plants; 59 miles of unauthorized routes (65 miles of which are weed-free) and 53 acres of open riding areas will be assessed for weeds and newly-discovered sites will be treated. 12 weed-infested sites will remain at high risk of spread.
Alternative 7	The prohibition of cross-country motorized travel will eliminate the potential for creation of new vectors for spread of non-native plants; 74 miles of unauthorized routes (69 miles of which are weed-free) and 53 acres of open riding areas will be assessed for weeds and newly-discovered sites will be treated. 12 weed-infested sites will remain at high risk of spread.

Compliance with the LRMP and Other Direction

Alternative 1 is consistent with the LRMP, which allows cross-country motorized travel that can encourage creation and of new unauthorized routes that could serve as vectors for weed introduction and spread. It is not in conformance with the Travel Management Rule.

The action alternatives, all of which include an amendment prohibiting cross-country motorized travel, are consistent with LRMP standards regarding introduction and spread of non-native plant species. These alternatives are also consistent with the Travel Management Rule, will be consistent with the LRMP once it is amended, and are consistent with Executive Order 13112.

Short-term Uses and Long-term Productivity

The NEPA requires consideration of "the relationship between short-term uses of man's environment and the maintenance and enhancement of long-term productivity" (40 CFR 1502.16). As declared by the Congress, this includes using all practicable means and measures, including financial and technical assistance, in a manner calculated to foster and promote the general welfare, to create and maintain conditions under which man and nature can exist in productive harmony, and fulfill the social, economic, and other requirements of present and future generations of Americans (NEPA Section 101).

Alternatives 3, 4, 6, 5, 7, and 2 respectively, from most to least, all have the potential to improve the long-term productivity by reducing the number and mileage of existing routes on the landscape. Routes that are not designated for public motor vehicle use will have the potential to revert to vegetated conditions.

Unavoidable Adverse Effects

Implementation of any of the alternatives would result in some unavoidable adverse environmental effects. Although formation of the action alternatives included avoidance of some potential adverse effects, other adverse effects could occur that cannot be completely mitigated. The environmental consequences section for each resource area discusses these effects.

Irreversible and Irretrievable Commitments of Resources

Irreversible commitments of resources are those that cannot be regained, such as the extinction of a species or the removal of mined ore. Irretrievable commitments are those that are lost for a period of time such as the temporary loss of timber productivity in forested areas that are kept clear for use as a power-line right-of-way or road.

It is not anticipated that designating, or not designating, some existing NFS land and unauthorized routes for public motor vehicle use would cause an irreversible or irretrievable commitment of resources.

Energy Requirements

Energy is consumed in the administration of the KNF. The major energy sources that may be affected by the travel management alternatives are gasoline and diesel fuel expended to complete required mitigations of action alternatives.

Legal and Regulatory Compliance

National Environmental Policy Act of 1969

NEPA at 40 CFR 1502.2(d) directs "Environmental impact statements shall state how alternatives considered in it and decisions based on it will or will not achieve the requirements of…environmental laws and policies." This EIS has been prepared in accordance with the following regulations:

National Historic Preservation Act (NHPA) of 1966

Section 106 of the NHPA of 1966 requires federal agencies to consider the potential effects of a Preferred Alternative on historic, architectural, or archaeological resources that are eligible for inclusion on the National Register of Historic Places and to afford the President's Advisory Council on Historic Preservation an opportunity comment. Section 110 of the Act requires federal agencies to identify, evaluate, inventory, and protect National Register of Historic Places resources on properties they control. Potential impacts to archaeological, historic, and paleontological resources have been evaluated in compliance with Section 106 of the NHPA. All identified properties will be treated as eligible for the National Register until they are evaluated and SHPO has provided a letter of concurrence regarding eligibility.

Executive Order 11644 – Off-Road Vehicle Management

Executive Order 11644 – Use of Off-Road Vehicles (ORVs) on Public Lands (issued February 8, 1972) – provides for the establishment of policies and procedures that will ensure that the use of ORVs on public lands will be controlled and directed so as to protect the resources of those lands, to promote the safety of all users of those lands, and to minimize conflicts among the various uses of those lands. Agency heads are directed to provide for administrative designations of the specific areas and trails on public lands on which the use of ORVs may be permitted, and areas in which the use of ORVs may not be permitted.

Executive Order 11989 – ORV Management

Executive Order 11989 – Use of Off-Road Vehicles on Public Lands (issued May 24, 1977) – clarifies agency authority to define zones of use by ORVs on public lands. Agency heads, when they determine that the use of ORVs will cause or is causing considerable adverse effects on the soil, vegetation, wildlife, wildlife habitat, or cultural or historic resources to immediately close such areas or trails to the type of ORV causing such effects, until such time that it is determined that such adverse effects have been eliminated and that measures have been implemented to prevent further recurrences.

Executive Order 12898 – Environmental Justice

Executive Order 12898 – Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations (issues February 11, 1994) – requires that each federal agency shall make achieving environmental justice part of its mission by identifying and addressing, as appropriate, disproportionately high or adverse human health or environmental effects of its programs, policies, and activities on minority populations and low-income populations. The preferred alternative does not disproportionately affect minority and low-income populations.

Clean Water Act

The Clean Water Act, as amended, regulates the dredging and filling of freshwater and coastal wetlands. Section 404 (33 USC 1344) of the Clean Water Act prohibits the discharge of dredged or fill material into waters (including wetlands) of the United States without first obtaining a permit from the U.S. Army Corps of Engineers. Wetlands are regulated in accordance with federal Non-Tidal Wetlands Regulations (Sections 40). No dredging or filling is proposed as part of any alternative considered under this project, and no permits are required.

This project complies with the Clean Water Act. None of the action alternatives will adversely affect beneficial uses of streams. Effects of the action alternatives are in each case a decrease in route density in affected watersheds, which equates to a beneficial effect on peak flow and timing, and a potential reduction in erosion and sediment delivered to streams.

This project also complies with the Total Maximum Daily Loads (TMDLs) for the Scott, Shasta, and Salmon Rivers, and the draft TMDL for the Klamath River. The TMDLs are amendments to the Basin Plan and are part of the California Water Code. This project constitutes a control of sediment waste discharge as required under the Memorandum of Understanding between the Regional Water Quality Control Board and the U.S Forest Service.

Clean Air Act of 1970

The Clean Air Act of 1970 and its amendments provide for the protection and enhancement of the nation's air resources. No exceedence of federal or state ambient air quality standards is expected to result from any alternative considered in this project.

Endangered Species Act (ESA) of 1973

The Endangered Species Act of 1973 (16 USC 1531 et seq.) requires that any action authorized by a federal agency not jeopardize the continued existence of a threatened or endangered species, or result in the destruction or adverse modification of habitat of such species that is determined to be critical. Section 7 of the ESA, as amended, requires the responsible federal agency to consult

the USFWS and the National Marine Fisheries Service (NOAA Fish) concerning endangered and threatened species under their jurisdiction. Biological assessments and evaluations (BA/BEs) for Endangered, Threatened, Candidate, and Sensitive species have been prepared for wildlife, fish, and plants. Consultation has occurred with USFWS and NMFS with determinations of No Effect (plants), and May Affect, Not Likely to Adversely Affect with Beneficial Effects (wildlife and fish). Further information is available in the Terrestrial Wildlife, Fisheries, and Botany sections of this chapter. Biological Assessments, Biological Evaluations, and the Biological Opinion are available in the project records at the KNF Supervisor's Office in Yreka, California.

National Forest Management Act (NFMA) of 1976

The National Forest Management Act of 1976 amends the Forest and Rangeland Renewable Resources Planning Act of 1974 and sets forth the requirements for Land and Resource Management Plan (Forest Plans) for the National Forest System. The KNF travel management action alternatives are consistent with the NFMA and the KNF Forest Plan (LRMP) as discussed in the various resource sections of this chapter.

Travel Management Regulations

The final travel management regulation (36 CFR 212, issued November 9, 2005, Subpart B) and subsequent Forest Service Manual (FSM) and Handbook (FSH) direction and guidance for implementation of 36 CFR 212, Subpart B (FSM 2350, 7700, and 7710, and FSH 7709.55 issued December 9, 2008) require designation of roads, trails, and areas that are open to motor vehicle use on National Forests. Designations are made by class of vehicle and, if appropriate, by time of year. Part 261 – Prohibitions, Subpart A (36 CFR 261.13) of the final rule prohibits the use of motor vehicles off designated roads, trails and areas as well as use of motor vehicles on roads and trails that is not consistent with the designations. All KNF travel management action alternatives are compliant with this regulation.

Other Pertinent Laws

Compliance with other pertinent laws and regulations is discussed in resource sections of this chapter. The travel management action alternatives are compliant with these laws and regulations.

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Chapter 4 - Preparers, Consultation, Distribution, Glossary, References, and Index

List of Preparers

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Consultation

Federal Agencies

USDI Fish and Wildlife Service
USDC National Marine Fisheries Service

State Agencies

State Historic Preservation Offices in
California and Oregon

County Agencies

Siskiyou County Board of Supervisors
Siskiyou County Natural Resources Department

Distribution of the Environmental Impact Statement

This FEIS has been distributed to the following government agencies and to those organizations and individuals who specifically requested a copy of the document.

Other parties on the project mailing list were provided with a summary document or notified that the full document is on the Klamath National Forest website.

Federal Agencies

Advisory Council on Historic Preservation
U.S. Department of Agriculture, Animal and Plant Health Inspection Service
U.S. Department of Agriculture Forest Service, Pacific Southwest Region (Region 5)
U.S. Department of Agriculture Forest Service, National Headquarters
U.S. Department of Agriculture, National Agricultural Library
U.S. Department of Agriculture, Natural Resources Conservation Service
U.S. Department of Agriculture, Office of Civil Rights
U.S. Department of Commerce,
- National Oceanic and Atmospheric Administration – Fisheries, Eureka Office
- National Oceanic and Atmospheric Administration – Fisheries, Yreka Office
- National Oceanic and Atmospheric Administration, Office of Policy and Strategic Planning
- National Marine Fisheries Service, Habitat Conservationists Division, Southwest Region

U.S. Department of Energy, Office of NEPA Policy and Compliance
Environmental Protection Agency, Office of Federal Activities
Environmental Protection Agency, Office of Federal Activities, Regions 9 and 10
Federal Aviation Administration, Western-Pacific Region
Federal Highway Administration, Western Region
U.S. Department of Homeland Security
U.S. Coast Guard
U.S. Department of Interior, Office of Environmental Policy and Compliance
U.S. Department of Interior, Fish and Wildlife Service, Yreka Office
U. S. Army Engineer Division, South Pacific

State Agencies

California Regional Water Quality Control Board, North Coast Region
State of California Department of Fish and Game
State of California Department of Forestry and Fire Protection (CALFIRE)
State of Oregon Department of Fish and Wildlife

Local Government Agencies

Siskiyou County

Organizations and Individuals

George Sexton, Klamath Siskiyou Wildlands Center
Bob Musgrove, Sierra Club
Scott Greacen, EPIC
Rick Svilich, American Forest Resource Council
Kimberly Baker, Klamath Forest Alliance
Richard Nawa, Siskiyou Project
Doug Heiken, Oregon Wild
Trout Unlimited
Roy Hall Jr., Shasta Tribe, Inc.
Shasta Indian Nation
Jim Bennett, Forks of Salmon Indian Council
Jim Lipke, Siskiyou County Off Road Riders
Stan VanVelsor, The Wilderness Society
Danielle Lindler, KARE
John Lyons, Backcountry Horsemen

Public Libraries

Siskiyou County Library, Yreka
Siskyou County Library, Mt. Shasta
Siskiyou County Library, Happy Camp
Siskiyou County Library, Etna
Siskiyou County Library, Fort Jones

Federally Recognized Tribes

Karuk Tribe of California
The Klamath Tribes
Quartz Valley Indian Reservation
Pit River Tribes
Yurok Tribe
Hoopa Valley Tribe
Confederated Tribes of Siletz Indians of Oregon
Confederated Tribes of Grand Ronde Community

Acronyms

4WD	**4-Wheel Drive**
ACHP	Advisory Council on Historic Preservation
APE	Area of Potential Effects
ATV	All-terrain Vehicle
BA	Biological Assessment
BE	Biological Evaluation
BMP	Best Management Practices
CARB	California Air Resources Board
CDFG	California Department of Fish and Game
CEQ	Council on Environmental Quality
CFR	Code of Federal Regulations
CNDDB	California Natural Diversity Database
CNPS	California Native Plant Society
CR	Cultural Resources
CVC	California Vehicle Code
CWE	Cumulative Watershed Effects
CWHR	California Wildlife Habitat Relationships
DBH	Diameter at Breast Height
DEIS	Draft Environmental Impact Statement
EHR	Erosion Hazard Rating
EIS	Environmental Impact Statement
EPA	Environmental Protection Agency
ERA	Equivalent Roaded Acres
ESA	Endangered Species Act of 1973
FR	Federal Register
FRTA	National Forest Roads and Trails Act
FS	Forest Service
FSH	Forest Service Handbook

FSM	Forest Service Manual
FSR	Forest Service Representative
FSS	Forest Service Sensitive
FTS	Forest Trail System
FWS	U.S Fish and Wildlife Service
FY	Fiscal Year
GIS	Geographic Information System
HWY	Highway
IDT	Interdisciplinary Team
IRA	Inventoried Roadless Area
LEI	Law Enforcement and Investigations
LEO	Law Enforcement Officer
MI	Miles
MIS	Management Indicator Species
ML1	Maintenance Level 1 (closed to public motorized use)
ML2	Maintenance Level 2
ML3	Maintenance Level 3
ML4	Maintenance Level 4
ML5	Maintenance Level 5
MMU	Motorized-Mixed Use
MOI	Memorandum of Intent
MTM	Motorized Travel Management
MVUM	Motor Vehicle Use Map
NEPA	National Environmental Policy Act
NF	National Forest
NFMA	National Forest Management Act
NFS	National Forest System
NFTS	National Forest Transportation System
NHPA	National Historic Preservation Act
NOI	Notice of Intent

NRHP	National Register of Historic Places
NVUM	National Visitor Use Monitoring
ORV	Off-Road Vehicle
OHV	Off-Highway Vehicle
PA	Programmatic Agreement
R5	Region 5
RARE	Roadless Area Review and Evaluation
RD	Ranger District
RMO	Road Management Objective
RNA	Research Natural Area
RO	Regional Office
ROD	Record of Decision
ROS	Recreation Opportunity Spectrum
RR	Riparian Reserve
SHPO	State Historic Preservation Office
SIA	Special Interest Area
S&G	Standard and Guideline
SOPA	Schedule of Proposed Actions
SUV	Sports Utility Vehicle
TCP	Traditional Cultural Property
T&E	Threatened and Endangered
TES	Threatened, Endangered and Sensitive
TM	Travel Management Rule
TMO	Trail Management Objective
TOC	Threshold of Concern
USC	United States Code
USDA	United States Department of Agriculture
USDI	United States Department of Interior
USFS	United States Forest Service
USFWS	United States Fish and Wildlife Service
VQO	Visual Quality Objective
WSR	Wild and Scenic River

Glossary

Administrative Unit - A National Forest or National Grassland.

All-Terrain Vehicle - Any motorized, off-highway vehicle 50 inches or less in width, having a dry weight of 600 pounds or less that travels on three or more low-pressure tires with a seat designed to be straddled by the operator. Low pressure tires are 6 inches or more in width and designed for use on wheel-rim diameters of 12 inches or less using an operating pressure of 10 pounds per square inch (psi) or less per vehicle-manufacturer recommendations.

Area - A separate specifically delineated space smaller than a Ranger District.

Deferred Maintenance - Maintenance not performed when scheduled and delayed for the future.

Designated Road, Trail, or Area - A National Forest System road, a National Forest System trail, or an area on National Forest System lands designated for motor vehicle use and displayed on a Motor Vehicle Use Map (MVUM).

Forest Development Road - A forest road under U.S. Forest Service jurisdiction.

Forest Development Trail - A forest trail under U.S. Forest Service jurisdiction.

Forest Highway - A forest road under jurisdiction of and maintained by a public authority and open to public travel.

Forest Road or Trail - A road or trail wholly or partly within or adjacent to and serving the National Forest System that the U.S. Forest Service deems necessary for protection, administration, and use for the National Forest System and the use and development of its resources.

Forest Transportation Atlas - A display of an administrative system's roads, trails, and airfields.

Forest Transportation Facility - A forest road or trail or an airfield that is displayed in a forest transportation atlas, including bridges, culverts, parking lots, marine access facilities, safety devices, and other improvements appurtenant to the forest transportation system.

Forest Transportation System - The system of National Forest System roads, National Forest System Trails, and airfields on National Forest System lands.

Four-Wheeled Drive Way - A National Forest System road included in the Forest Transportation Atlas and commonly used by four-wheel drive, high clearance vehicles with a width greater than 50 inches unless designated and managed as a trail.

Jurisdiction - The legal right to control and regulate the use of a transportation facility. Roads on National Forest System lands are under the control of the U.S. Forest Service except for public roads established under the Act of July 26, 1866; private roads; roads for which the U.S. Forest Service has granted rights-of-way to private landowners or public road agencies; and roads whose use and rights pre-date the National Forest.

Maintenance Levels - The level of service provided by and maintenance required for a specific road, consistent with road management objectives and maintenance criteria.

Maintenance Level 1 - Assigned to intermittent service roads when they are closed to vehicular traffic. The closure period must exceed one year. Basic custodial maintenance is performed to keep damage to adjacent resources to an acceptable level and to perpetuate the road to facilitate future management activities. While being maintained at level 1, roads are closed to vehicular traffic but may be open and suitable for non-motorized uses.

Maintenance Level 2 - Assigned to roads open for use by high-clearance vehicles. Traffic is normally minor, usually consisting of one or a combination of administrative, permitted, dispersed recreation, or other specialized uses. Log haul may occur at this level.)

Maintenance Level 3 - Assigned to roads open and maintained for travel by a prudent driver in a standard passenger car. Roads in this maintenance level are typically low speed, single lane with turnouts and spot surfacing. Some roads may be fully surfaced with either native or processed material.

Maintenance Level 4 - Assigned to roads that provide a moderate degree of user comfort and convenience at moderate travel speeds. Most roads are double lane and aggregate surfaced. Roads may be paved and/or dust abated.

Maintenance Level 5 - Assigned to roads that provide a high degree of user comfort and convenience. These roads are normally double-lane, paved facilities. Some may be aggregate surfaced and dust abated.

Mixed Use - Designation of an NFTS road for use by both highway legal and non-highway legal motor vehicles.

Motor Vehicle - Any self-propelled vehicle other than a vehicle operated on rails or any wheelchair or mobility device, including battery-powered chairs, designed solely for use by a mobility-impaired person for locomotion and suitable for use in an indoor pedestrian area.

Motor Vehicle Use Map (MVUM) - A map reflecting designated roads, trails, and areas on a National Forest System administrative unit or Ranger District.

National Environmental Policy Act (NEPA) Procedures - The rules, policies, and procedures governing agency compliance with the National Environmental Policy Act.

National Forest System - As defined in the Forest Rangeland Renewable Resources Planning Act, the “National Forest System'” includes all National Forest lands reserved or withdrawn from the public domain of the United States, all National Forest lands acquired through purchase, exchange, donation, or other means; the National Grasslands and land use projects administered under Title III of the Bankhead-Jones Farm Tennant Act (50 Stat. 525, 7 U.S.C. 1010- 1012); and other lands, waters, or interests therein administered by the U.S. Forest Service or are designated for administration through the U.S. Forest Service as part of the system.

National Forest System Land - All Forest Service-administered lands, waters, or interests therein.

National Forest System Road - A forest road other than a road that has been authorized by a legally documented right-of-way held by a state, county, or other local public road authority.

National Forest System Trail - A forest trail other than a trail that has been authorized by a legally documented right-of-way held by a state, county, or other local public road authority.

National Recreation Trail - A trail that provides a variety of outdoor recreation uses in, or reasonably accessible to, urban areas.

Off-Highway Vehicle (OHV) - Any motorized vehicle designed for or capable of cross-county travel on or immediately over land, water, sand, snow, ice, marsh, swampland, or other natural terrain.

Off-Road Vehicle - Synonymous with off-highway vehicle (OHV).

Over-Snow Vehicle - A motor vehicle designed for use over snow that runs on a track or tracks and/or a ski or skis while in use over snow.

Passenger Cars - Vehicles that are passenger cars of all sizes; sport/utility vehicles; minivans; vans; and pickup trucks.

Public Road - Any road or street under the jurisdiction of and maintained by a public authority and open to public travel.

Right-of-Way - A privilege or right to cross over or use the land of another party for egress and ingress such as roads, pipelines, irrigation canals, or ditches. The right-of-way may be conveyed by an easement, permit, license, or other instrument.

Road - A motor vehicle route over 50 inches wide, unless identified and managed as a trail.

Road Construction or Reconstruction - Supervising, inspecting, actual building, and incurrence of all costs incidental to the construction or reconstruction of a road.

Road Decommissioning - Activities that result in stabilizing and restoring unneeded roads to a more natural state.

Road Management Objectives - The intended purpose of an individual road based on management area direction and access management objectives. Road management objectives contain design criteria, operation criteria, and maintenance criteria.

Special Use Authorization - A permit, term permit, lease, or easement that allows occupancy, use, rights, or privileges of National Forest System land.

Temporary Road or Trail - A road or trail necessary for emergency operations or authorized by contract, permit, lease, or other written authorization that is not a forest road or trail and that is not included in a Forest Transportation Atlas.

Trail - A route 50 inches or less in width or a route over 50 inches wide that is identified and managed as a trail.

Trail Vehicle - A vehicle designed for trail use, such as bicycles, snowmobiles, trail bikes, trail scooters, and all-terrain vehicles.

Travel Management Atlas - An atlas that consists of a Forest Transportation Atlas and a Motor Vehicle Use Map (MVUM) or Maps.

Unauthorized Road or Trail - A road or trail that is not a forest road or trail or a temporary road or trail and is not included in a Forest Transportation Atlas.

Wheelchair - A device designated solely for use by a mobility impaired person for locomotion and suitable for use in an indoor pedestrian area.

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