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Six Rivers National Forest Roads Analysis

Version 1.0

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U.S. Department of Agriculture
Forest Service
Pacific Southwest Region
Six Rivers National Forest

Located within Humboldt, Del Norte, Siskiyou and Trinity Counties, California

February 2003

Cover Photo: Little Jones Creek Road, Smith River National Recreation Area

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Chapter I. Introduction

Forest wide Roads Analysis

On January 12, 2001, the Forest Service issued the Administration of Forest Development Transportation System final rule, often referred to as the 'Roads Rule' (36 CFR Part 212, et al.). This rule revises the Forest Service Manual concerning the management, use, and maintenance of the National Forest Transportation System. Interim directives were issued on July 27 and December 14, 2001 to clarify the Forest Service Manual. The final rule is intended to help ensure that:

1. Additions to the National Forest System road network are essential for resource management and use,
2. Construction, reconstruction, and maintenance of roads minimize adverse environmental impacts and,
3. Unneeded roads are decommissioned and restoration of ecological processes is initiated.

The results to be achieved by managing the forest transportation system (FSM7702) are as follows:

1. To provide sustainable access in a fiscally responsible manner to National Forest System lands for administration, protection, and utilization of these lands and resources consistent with Forest Plan guidance.
2. To manage a forest transportation system within the environmental capabilities of the land.
3. To manage forest transportation system facilities to provide user safety, convenience, and efficiency of operations in an environmentally responsible manner and to achieve road related ecosystem restoration within the limits of current and likely funding levels.
4. To coordinate access to National Forest System lands with national, regional, statewide, local, and Tribal government transportation needs.

The objectives of transportation analysis (FSM 7712.02) are as follows:

1. To identify transportation management opportunities and priorities
2. To assess transportation management needs, long-term funding, and expected ecosystem, social, and economic effects, including effects on the values of roadless and unroaded areas.
3. To establish transportation management objectives and priorities

In addition, the objectives of transportation analysis include (FSM 7710.2):

1. To determine, within the context of current and likely funding levels, the minimum transportation facilities needed for public and agency access to achieve

forest land and resource management goals and to safeguard ecosystem health within the context of current and likely funding levels.
2. To incorporate transportation system needs into the forest land and resource management planning process.
3. To direct the orderly improvement and management of the transportation system and to ensure the documentation of decisions affecting the system
4. To interact with and involve the public, State, local, and Tribal governments, and other Federal agencies in transportation analysis

The intent of performing transportation analysis is to provide decision-makers with critical information to develop road systems that are safe and responsive to public needs and desires, are affordable and efficiently managed, have minimal negative ecological effects on the land, and are in balance with available funding for needed management actions.

The Roads Analysis Process

Roads analysis is a six-step process, as described in the handbook Roads Analysis: Informing Decisions about Managing the National Forest Transportation System (USDA Forest Service 1999). The steps are designed to be sequential with an understanding that the process may require feedback and iteration among steps and over time as an analysis matures.

1. Setting up the analysis
2. Describing the situation
3. Identifying the issues
4. Assessing benefits, problems and risks
5. Describing opportunities and setting priorities
6. Reporting (Key Findings)

Step 1. Setting up the Analysis

The analysis must be designed to produce an overview of the road system. Line offices will establish appropriate interdisciplinary teams (IDT) and identify the proper analytical scales. The IDT will develop a process plan for conducting the analysis. The output from this step will include assignment of IDT members, a list of information needs, and a plan for the analysis.

Step 2. Describing the Situation

The IDT will describe the existing road system in relation to current forest plan direction. Products from this step will include a map of the existing road system, description of access needs, and information about physical, biological, social, cultural, economic, and political conditions associated with the road system.

Step 3. Identifying the Issues

The IDT, in conjunction with line officers and the public, will identify important road-related issues and the information needed to address these concerns. The IDT will also

determine data needs associated with analyzing the road system in the context of the important issues, for both existing and future roads. The output from this step includes a summary of key road-related issues, a list of screening questions to evaluate them, a description of relevant available data, and what additional data will be needed to conduct the analysis.

Step 4. Assessing Benefits, Problems, and Risks

After identifying the important issues and associated analytical questions, the interdisciplinary team will systematically examine the major uses and effects of the road system including the environmental, social, and economic effects of the existing road system, and the values and sensitivities associated with unroaded areas. The output from this step is a synthesis of the benefits, problems, and risks of the current road system and the risks and benefits of building roads into unroaded areas.

Step 5. Describing Opportunities and Setting Priorities

The IDT and line officers will identify management opportunities, establish priorities, and formulate technical recommendations that respond to the issues and effects. The output from this step includes a map and descriptive ranking of management options and technical recommendations.

Step 6. Reporting

The IDT will produce a report and maps that portray management opportunities and supporting information important for making decisions about the future characteristics of the road system. This information sets the context for developing proposed actions to improve the road system and for future amendments and revisions of forest plans.

Chapter II. Step 1: Setting Up the Analysis

Forest –scale Roads Analysis

A Forest-scale roads analysis (RAP) provides a context for Forest-scale transportation planning and road management in the broader framework of managing all forest resources as well as the context for informing road management decisions and activities at the watershed scale (FSM 7712.13 and FSM 7712.13c). The Forest-scale RAP focuses on major transportation routes, which consist of arterials and collector routes (FSM 7712.14). These major routes generally consist of Forest Service Maintenance Level 3, 4, and 5 roads that provide access to large land areas across the Forest and to significant recreational destinations such as campgrounds, picnic sites, and trailheads. Benefits, problems, and risks associated with these key routes have been identified, and recommendations made relative to the investments needed to properly manage these elements of the transportation system. Recommendations for these key routes are limited to changes in maintenance level or the identification of maintenance needs. Because these key routes serve important access needs, decommissioning was not considered as an option.

Maintenance Level 3, 4 and 5 roads are constructed and maintained to a standard that accommodates the prudent driver of a passenger car. By contrast, Level 1 and 2 roads are for use by high-clearance vehicles only. Watershed scale roads analysis will focus on all roads within the watershed, including Level 1 and 2, and unclassified roads.

The overall objective of Forest-scale transportation planning is to assess transportation management needs, long-term funding needs, and expected ecosystem, social, and economic effects, including effects on the values of roadless and unroaded areas (FSM 7710.2). The objectives are:

- To determine, within the context of current and likely funding levels, the minimum transportation facilities needed for public and agency access to achieve forest land and resource management goals and to safeguard ecosystem health within the context of current and likely funding levels.
- To incorporate transportation system needs into forest land and resource management planning process
- To direct the orderly improvement and management of the transportation system and ensure the documentation of decisions affecting the system
- To interact with and involve the public, State, local, and Tribal governments and other Federal agencies in transportation analysis

This will be accomplished by:

- Identification of key routes for accessing National Forest lands
- Identification of strategic road management issues & priorities

- Identification of effects of transportation facility construction, reconstruction, maintenance, and decommissioning on ecological processes and ecosystem health, diversity, and productivity
- Identification of key issues to be addressed at lower scales
- Coordination with other government agencies and jurisdiction

National Environmental Policy Act (NEPA) and Road Analysis (FSM 7712.11)
Road management decisions will not be a direct product of roads analysis. Rather, road management recommendations will be a product of roads analysis and will be used as a basis for proposed actions and disclosed in future appropriate NEPA documents (FSM 1950 and FSH 1909.15). Road analysis will result in informed NEPA decisions related to road management.

Future roads analyses conducted at the watershed and project scales will tier to this document and begin by addressing the pertinent general issues and concerns identified in the Forest scale analysis. Watershed and project roads analyses will use detailed information, and may include local knowledge and information specific to particular landscapes and road segments. In terms of outcomes, analysis at the watershed and project scales will at a minimum, include the following (FSM 7712.13c):

- Identification of needed and unneeded roads
- Identification of road associated environmental and public safety risks.
- Identification of site-specific priorities and opportunities for road improvements and decommissioning
- Identification of areas of special sensitivity, unique resource values, or both
- Any other specific information that may be needed to support project-level decisions

Regardless of the scale at which it is conducted, roads analysis will include methods for identifying opportunities for increasing benefits of the road system and reducing existing problems and risks. It will provide a framework for examining important issues and developing relevant information before managers enter into a formal environmental assessment (NEPA) process.

The identification and decommissioning of unneeded roads is a management objective identified in the Six Rivers Land and Resources Management Plan (LRMP) and as a national priority. Roads are most often decommissioned for watershed restoration purposes, or because they are no longer needed to manage National Forest System lands. Since the implementation of the Northwest Forest Plan in 1995, there has been no net gain in road miles across the Forest. In fact the Forest has reduced the total road miles on the Forest by decommissioning 212 miles of road, the majority of which were Operational Maintenance Level (OML) 1 and 2 (see page 13 for definitions of OML). An additional 9 miles of road are scheduled for decommissioning in 2002. There are no plans for any new permanent road construction on the Forest.

Finally, roads analysis is intended to be an ongoing and iterative process that is continually responsive to changing conditions, including available funding, research and monitoring results, changes in physical or environmental conditions, and new regulatory requirements.

Public Involvement

Public involvement is a key factor in the roads analysis process. The public involvement followed *The Northern Province - Roads Analysis Process - Communication and Public Involvement Strategy* dated December 2001. At the Forest-scale RAP, public involvement is designed to 1) increase awareness and knowledge about the process; 2) provide information on major transportation routes; 3) gather information on general public issues and concerns relating to road use and management; and 4) seek public help in developing guidelines for addressing road management issues and priorities to be used at the watershed and project scale RAPs.

We sought comments on the RAP from the 12 federally recognized tribes associated with our Forest. On March 18, 2002, a letter explaining the roads analysis process was mailed to the tribal chairs. Enclosed was a list and maps(s) of the Level 3, 4, and 5 roads and Draft Road Assessment Criteria. We requested they review the information and provide input on opportunities to reduce the maintenance levels on any of these roads and provide and additional criteria we should use. No comments were received from any of the tribes.

On March 27, 2002 a power point presentation on the Six Rivers and Mendocino National Forest roads analysis process was made to the California Coastal Provincial Advisory Committee (PAC). A list and maps(s) of the Level 3, 4 and 5 roads and Draft Road Assessment Criteria was provided. PAC members asked questions for clarification, provided input on the analysis, and expressed interest in receiving additional information as it became available. The results of the roads analysis were presented to the PAC on November 21, 2002.

On April 19, 2002, a news release was sent to local media in Humboldt, Del Norte and Trinity counties. The news release explained the Forest-scale process and provided a Forest Service contact for anyone interested in becoming involved. Also, on April 19, 2002, a letter was mailed to 200 publics, including recreationists, environmental communities, commodity/user groups, elected officials, federal and state agencies, community groups and private landowners who had expressed interest in past projects. The RAP was also sent to the Humboldt, Del Norte, and Trinity Boards of Supervisors and planning departments. The letter provided in explanation of the roads analysis process and requested they return the enclosed response form if they wanted to remain on the RAP mailing list.

On May 22, 2002, an information packet was mailed to the 87 individuals and groups that expressed interest in the process, as well as all 12 federally recognized tribes. The packet contained the tables and maps of all OML 3,4 and 5 roads for each ranger district with the

current conditions of the road, and any comments, opportunities or recommendations that had been developed. We also invited the public to attend any of the five public meetings to be held in Willow Creek, Crescent City, Mad River, Orleans and Eureka May 30 through June 19, 2002. We again solicited comments on the information provided.

On June 17, 2002, the RAP was presented to Congressman Mike Thompson's representative, Liz Murguia. No comments were received.

On May 23, 2002, a news release announcing the meetings was also sent to the Forest media list. Thirty-four people attended these meetings. Display Advertisements providing information on these meetings were placed in the following newspapers: Times Standard, Eureka (May 30), Del Norte Triplicate (May 25, 2002), Crescent City, and Kourier, Willow Creek (May 29, 2002). Response to the comments raised during the meetings and written comments received are located in the project file. In summary, the primary concerns raised were:

- Loosing access to public lands
- Current and future funding levels in relations to losing access
- Maintaining access for fire suppression
- Loosing access for recreation, including off highway vehicles
- Potential negative environmental impacts from the road system

The Roads Analysis document was mailed to anyone that requested a copy, provided written comments or attended the public meetings, and was posted on the Six Rivers National Forest Internet site, http://www.fs.fed.us/r5/sixrivers.

Chapter III. Step 2: Describing the Situation

General Forest Information

The Six Rivers National Forest (SRNF) is located in northwestern California, extending from the Oregon border south nearly to Mendocino County. The Forest comprises 958,470 acres within Del Norte, Humboldt, Trinity, and Siskiyou Counties. The six major rivers that pass through the Forest are the Smith, Klamath, Trinity, Mad, Eel and Van Duzen. Within the Forest boundary, these six river systems contain approximately 5,674 miles of streams and 159,000 acres of riparian habitat. Over 61 species of wildlife depend on this riparian network. Associated with the stream channel and riparian area network are approximately 160,000 acres of inner gorges and steep slopes. The Forest is composed of extensive stands of coniferous forest in rugged, mountainous settings, with small amounts of oak woodland and grassland near the southern border. Elevations range from near sea level in the west to just under 7,000 feet along the eastern mountain crests.

The SRNF also manages the Ukonom District, which is part of the Klamath National Forest. This District is 190,207 acres in size and has one major river system, the Salmon River, within its boundaries. The Ukonom District is adjacent to the Orleans District and is considered throughout this document as part of the Orleans District.

Six Rivers National Forest Land and Resource Management Plan

The Six Rivers Forest Land and Resource Management Plan (LMRP) was approved in 1995. The purpose of the LRMP is to guide the management of the Forest in a manner that integrates protection and use of Forest resources and addresses local, regional, and national issues while meeting applicable laws and regulations. It tiers to the Northwest Forest Plan, a comprehensive and innovative plan for ecologically sustainable resource management in the Pacific Northwest. The LRMP has three broad goals: maintaining biodiversity and ecosystem health; providing customer service; and actively involving the public in the management of the Forest. To meet these goals, the LRMP delineates 17 management areas within six key land allocations. Each management area has unique goals, desired conditions, and management prescriptions.

Forest Road System

Access to the Forest for management of its resources and for its use and enjoyment by the public is dependent on state and county roads as well as National Forest system roads. Most activities on the Forest, including camping, hunting, fishing, motorized recreation, hiking, enjoying rivers and streams, suction dredge mining, and gathering fuel-wood and other forest products, are available because a Forest road provides access to them. Driving for pleasure and viewing scenery is a popular recreational activity on the Forest (LRMP).

The SRNF has more than 3,000 miles of road within the Forest boundary (Table 1). These roads are identified as arterial, collector, or local roads. Arterial roads are primary travel routes, usually higher standard roads managed for use with a higher level of comfort (i.e. passenger car); they serve large land areas, often connecting to County or State roadways. Collector roads are managed at lesser degree of user comfort and move traffic from local roads or destinations to arterial roads. Local roads, which may be constructed for short- or long-term service, connect destination points with collector roads (i.e. trailhead or campground).

Table 1 Miles of Road within Six Rivers National Forest by Type and Jurisdiction

Type	Forest Service/ 1/ NFSR	Other 2/	County	State	Total
Arterial	250		107	82	439
Collector	670		189		859
Local	2067	96			2163
Total Miles	**2987**	**96**	**296**	**82**	**3461**

1/ NFSR: National Forest System Roads, 2/Other: Roads under special use authorization to parties other than public road agency such as private landowners.

Major transportation routes through the Forest are State Highways 199, 299, 96, and 36. State Highways 96, 199 and 299 are designated National Scenic Byways.

Del Norte, Humboldt, Siskiyou, and Trinity counties and the Hoopa Valley Indian Reservation maintain approximately 325 miles of road that serve most of the residential areas within the Forest; about 20 percent of which are outside the Forest boundary.

Forest Highways are specially designated roads that qualify for funding under the Federal Lands Highway Program. A transportation agency, such as the state or county, has jurisdiction over Forest Highways. The planning process for them is a joint effort between the Federal Highway Administration, the Forest Service and the state transportation agency (Caltrans) that represents the counties. There are more than 300 miles of Forest Highway within Six Rivers National Forest as identified in Table 2.

Table 2 Federal Lands Highway Program Forest Highways

Responsible Agency	Agency Road Number	Forest Highway Name	Length (miles)
State of California	36	Van Duzen-Peanut	50.0
Del Norte County	S-427	South Fork Smith River	16.0
	316	Patrick Creek	11.4
	411	French Hill	12.4
	405	Big Flat	15.3

Responsible Agency	Agency Road Number	Forest Highway Name	Length (miles)
Humboldt County	9R100	Ishi Pishi	8.5
	8Q100	Red Cap	7.2
	7M100	Brannan Mt	6.9
	8M130	Patterson	3.1
	7K100	Titlow Hill	6.3
	8L100	Friday Ridge	3.3
Trinity County	447	South Fork	10.8
	402	Denny	5.4
	511	Van Duzen	15.5
	501	Lower Mad River	17.1
	504	Upper Mad River	12.3
	503	Zenia Lake	17.0
	520	Long Ridge	10.0
	524	Barry Creek	3.8
Humboldt County	F6B165/F8L090	Alderpoint	56.7
Trinity County	C8C100/519	Zenia-Ruth Hoaglin/Peak	11.0
Siskiyou County	2B01	Salmon River	17.8

Existing roads under Forest Service jurisdiction consist of approximately 2,900 miles of classified forest system roads that are designated as components of the Forest transportation system. More than 1500 of those miles are maintained primarily for high clearance vehicles such as logging trucks, pickups, and off-highway (OHV) recreational vehicles. The Forest also contains over 200 miles of unclassified roads.

Road Maintenance

Forest roads are maintained to safely accommodate the intended use and in accordance with maintenance criteria documented in the road maintenance objectives (RMO; FSM7732.03). Road maintenance activities frequently involve correction of drainage problems. Drainage structures are generally constructed in locations to minimize impacts of road building on watersheds. Routine road maintenance projects help maintain the functionality of the designed drainage structures along roads. Routine maintenance activities are described in Appendix A.

Current LRMP direction is to close roads not needed for administrative, recreation, resource protection, commercial and/or public access (LRMP) and to manage needed roads at the lowest maintenance level consistent with resource management needs.

In addition to LRMP standards and guidelines, the Region 5 Forest Service Soil and Water Conservation Handbook established Best Management Practices (BMPs) to guide all road maintenance operations. The BMP Handbook contains explicit guidance in

section 12.22 to protect water quality. The objectives for the BMPs specific to road maintenance are attached as Appendix B.

The USFS has the responsibility to provide for the safety of the Forest visitor and to operate and maintain roads in accordance with regulations implementing the Highway Safety Act (23 U.S.C. sections 401-410). Regulations governing highway safety standards applicable to the Forest Service are found at Forest Service Manual (FSM) 1535.11. Routine maintenance projects allow the Forest to meet its responsibilities.

1. Operational Maintenance Level (OML)

The Transportation System Maintenance Handbook (FSH 7709.58) describes the various maintenance levels for managing USFS road systems. Roads assigned operational maintenance levels 3, 4, or 5 are to be maintained in accordance with the requirements of the Highway Safety Act as indicated by FSM 1535.11 since these roads are accessible by passenger cars. In the past, timber sale contracts required timber operators to perform road maintenance on roads in the sale area. Due to the reduction in timber-related and other resource extraction activities, road maintenance activities associated with these contracts are no longer being performed. Road maintenance is currently being done using appropriated funds. The majority of maintenance activities occur on the higher maintenance level roads (OML 3-5), for user driving safety. Table 3 displays the miles of road by maintenance level for each District. Appendix C contains maps of OML 3, 4 and 5 roads by each District.

National Forest System Roads are those forest roads under the jurisdiction of the USFS that are constructed to specific standards depending on the needs identified for the road. Roads will be maintained and available for use at maintenance levels commensurate with the identified management needs.

Maintenance Level 1
This level is assigned to roads that are closed to vehicular traffic for a period of greater than one year but still exist on the forest transportation system for potential future use. Custodial maintenance is done to provide the basic care needed to protect the road investment and minimize damage to adjacent land and resources.

Maintenance Level 2
This level is assigned to roads that will be open for use by high clearance vehicles. Passenger car traffic is not a consideration. Traffic volumes are usually minor. Provides the basic custodial care described above and keeps roadway clear for safe passage.

Maintenance Level 3
This level is assigned to roads that will be open and maintained for safe travel by a prudent driver in a passenger car. User comfort and convenience is not considered a priority. Roads at this maintenance level are normally characterized as low speed, single lane with turnouts. The SRNF considers the functional classification of these roads is normally a collector (has lower level roads branching off from it).

Maintenance Level 4
This level is assigned to roads that will provide a moderate degree of user comfort and convenience at moderate travel speeds. Some roads may be single lane and some may be paved/and or dust abated. The SRNF considers the functional classification of these roads is normally collector or minor arterial (has one or more collectors branching off from it).

Maintenance Level 5
This level is assigned to roads that will 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.

Table 3 Miles of road by maintenance level for each Ranger District

OML	NRA	OR	LT	MR	UK	Totals
1	87.42	136.29	102.34	38.37	165.65	530.07
2	267.78	255.40	258.74	603.58	151.80	1537.30
3	170.71	121.71	142.24	146.87	88.55	670.08
4	19.00	60.24	46.81	51.19	24.47	201.71
5	18.55	29.20	0.00	0.00	0.00	47.75
Total	563.46	602.84	550.13	840.01	430.47	2986.91

NRA= National Recreation Area; OR = Orleans; LT = Lower Trinity; MR = Mad River; UK = Ukonom

2. Maintenance Costs

In the past when timber hauling was the primary road use, road maintenance was accomplished primarily with timber sale contracts where the private contractor provided maintenance during harvest operations. However, road maintenance budgets have been steadily declining in proportion to total system needs as a result of inflation and the decline in timber harvest. As a result, the road system is deteriorating. Eventually, substantial investments will be necessary to return Forest system roads to a condition where they can function as originally intended. Currently, the Forest administers direct road maintenance contracts to maintain roads at the minimum levels necessary for resource protection and vehicular safety.

Deferred maintenance is work that can be postponed without loss of road serviceability until the work can be economically or efficiently performed. Deferred maintenance is most often associated with surface replacement and drainage maintenance, followed by brushing and signing needs.

Based upon the annual “Forest Cost Per Mile Deferred Maintenance Summary” report dated October 1, 2002, the deferred maintenance needs for the Mad River, Lower Trinity, and Orleans Ranger Districts, and the Smith River National Recreation Area is approximately $37.5 million to complete the backlog of deferred maintenance for all maintenance levels to bring the road system back to a standard that meets the established maintenance levels. The majority of this work is associated with surface replacement,

signing, removing encroaching vegetation, replacing culverts that are not designed to pass a 100-year storm event, or surfacing roads for resource protection.

Estimated Annual Costs

The current annual road budget (FY 2002) for the Six Rivers National Forest is approximately $833,688. This covers salary, equipment, contracts, supplies, overhead and administrative costs. Approximately 75% of the budget ($625,266) is used to maintain OML 3, 4, and 5 roads. To complete the deferred maintenance on the OML 3, 4, and 5-road system would cost in excess of $24,000,000 as of the date of this report.

Over the past 20 years, the road maintenance budget for the Forest Service has declined. This decline in funding creates a situation in which it is not feasible to fully maintain the existing road system at current maintenance levels. There are significant differences between the costs associated with each maintenance level. Table 4 below is a summary of the deferred and annual maintenance costs per mile of Forest road based upon the "Forest Cost Per Mile Deferred Maintenance Summary".

Table 4 Annual maintenance costs per mile

OML	Defferred maintenance per road mile	Annual maintenance per road mile
1	$3,050	$200
2	$9,100	$1,800
3	$ 28,900	$7,200
4	$ 44,100	$16,800
5	$ 10,100	$300

The current road system is maintained based upon available funding. Funding is directed to roads based upon the priority identified on the Forest or by national directives, and focuses on public safety and resource concerns.

Opportunities to reduce maintenance costs may be achieved through the elimination of unneeded roads, reduction of objective and operational maintenance levels to appropriate minimums, and the pursuit of opportunities to reduce the maintenance requirements associated with different road design templates.

Chapter IV. Step 3: Identifying Issues

The purpose of Step 3 is to identify the key questions and issues affecting road-related management on the Forest. The issues presented have been raised either during this analysis or as part of past project analyses relating to the Forest transportation system. Issues have been identified by members of the public, local tribal and County governments, State and Federal agencies, and by Forest Service line officers and specialists. These issues will be addressed at all levels of roads analysis.

The document *Roads Analysis: Informing Decisions about Managing the National Forest Transportation System* (USDA Forest Service 1999) developed 71 questions that might be used for roads analysis for both the existing or potential road system. Not all the questions are relevant at all levels of roads analysis and many are only appropriate at a regional, forest, or watershed level. The questions were designed to assist analysis teams in developing criteria and approaches appropriate to the analysis area. The guideline handbook also provides direction and suggestions about the best scale at which each question could be answered. The full list of questions and the scale at which they should be answered is located in Appendix D. The IDT used the guidance provided on which questions to address at this Forest-scale RAP, but also answered other questions if the information was available.

A. Watershed Processes and Aquatic Resources

Road networks in many areas of the Pacific Northwest are the most significant source of management-accelerated delivery of sediment to anadromous fish habitats, often exceeding all other sources attributed to forest activities combined (FEMAT 1993). In addition to acceleration of sedimentation, there are numerous direct and indirect impacts to aquatic systems associated with road construction and management (Meehan 1991). While some of these impacts may be positive, such as accessibility to fishing areas or the protection of watersheds from catastrophic wildfire, roads have unavoidable effects on streams, wetlands and riparian areas no matter how well they are located, designed and maintained. Forest standards and guidelines pertaining to roads management provide a set of protection and restoration measures designed to minimize effects of roads within Riparian Reserves consistent with Aquatic Conservation Strategy Objectives (LRMP).

Availability of information allows for the assessment of aquatic issues using spatial data at two scales: (1) individual roads for proposed Level 3-5 roads, and (2) road systems by watershed. Details concerning criteria used for aquatic ratings and the results for individual roads are located in Chapter VI. Road impacts at the watershed scale are evaluated by addressing the 14 aquatic questions as described in the Roads Analysis handbook. Impacts on watershed condition consider all roads within each watershed, regardless of OML level. Data used to answer aquatic questions was compiled from *Rating Watershed Condition: Reconnaissance Level Assessment for the National Forests of the Pacific Southwest Region* (USDA Forest Service, Draft 2.4, April 2000). This

report was part of a regional effort to evaluate watershed condition and much of the data generated in the report was applicable for our Roads Analysis. Watersheds were delineated at the 5th field scale for National Forest Lands, which includes all of the Six Rivers National Forest and watersheds on the Ukonom District that were not included in the Klamath Roads Analysis. Criteria used to determine hazard ratings for the watershed scale analysis are located in Appendix E. The key questions addressed in this assessment of aquatic issues are applicable at forest, watershed, and project scales; and can be readily used with data of varying resolution.

Key Question

How and where does the road system modify the surface and subsurface hydrology of the area?

The hydrology of the Forest is rain dominated, with snow accumulating above 4,000 feet elevation during the winter months. Mean annual precipitation varies from 60-90 inches and typically occurs between October and June. Occasional short duration, high intensity thunderstorms occur during the summer months.

Roads can expand the channel network, convert subsurface flow to surface flow, and reduce infiltration on the road surface. The channel network is expanded by road ditches and road-related erosional features, which intercept and concentrate runoff from their natural flowpath. These factors may affect the overall hydrology in a watershed, particularly the quantity and timing of flow.

Reduced infiltration contributes to additional surface flow since water does not infiltrate for storage in the soil profile, but rather runs off as overland or surface flow. Storage and movement of water through the soil profile as subsurface flow regulates and sustains baseflows. When roads disrupt these processes, more water becomes available during peak flows, and less water is available to sustain baseflows.

Road Hazard Potential indicator is used to best represent the potential for altered hydrologic regime (changes in runoff response) and stream diversions associated with roads. The overall condition class is determined by examining the slope position, slope gradient, proximity to stream channels, number of stream crossings, and density of the road system for each watershed (Table 5).

Table 5 Six Rivers Watershed Condition Assessment- Road Hazard Potential

Analysis Watershed Name	Road Hazard Potential
Blue Creek	Low Hazard
Bluff Creek	Low Hazard
Grouse-Madden	Low Hazard
Lower-Middle Klamath	Moderate Hazard
Lower North Fork Smith	Low Hazard
Middle Fork Smith	Moderate Hazard
Middle Mad River	Moderate Hazard

Analysis Watershed Name	Road Hazard Potential
Myrtle-Hardscrabble	Moderate Hazard
Red Cap Creek	Low Hazard
South Fork Smith	Low Hazard
Trinity-New to SF Trinity	High Hazard
Trinity-SF to Tish Tang	Moderate Hazard
Upper Little Van Duzen	Low Hazard
Upper Mad River	Moderate Hazard
Upper North Fork Eel	Low Hazard
Upper Van Duzen River	High Hazard
Wooley Creek	Low Hazard
Ishi-Pishi	High Hazard

The following is a list of opportunities to consider if roads are likely to modify surface and subsurface hydrology:

- Design roads to minimize interception, concentration, and diversion potential.
- Use outsloping and sufficient numbers of drainage structures to disconnect road ditches from stream channels.
- Construct critical dips where diversion potential exists at stream crossings.

Key Question
How and where does the road system generate surface erosion?

Surface erosion is highly dependant on soils, road surfacing, road grade, age of the road, traffic volumes, and the effectiveness and spacing of drainage structures. Studies have indicated that sediment delivery to stream systems is highest in the initial years after road construction, although unlined ditches and road surfaces with little armor can remain chronic sources of sediment.

Surface erosion condition is determined by examining the density of roads on erodible soils (Table 6). This indicator addresses the potential for altered sediment regime associated with surface erosion accelerated by road construction and road maintenance.

Table 6 Six Rivers Watershed Condition Assessment- Surface Erosion

Analysis Watershed Name	Road Hazard Potential
Blue Creek	Low Hazard
Bluff Creek	Low Hazard
Grouse-Madden	Moderate Hazard
Lower-Middle Klamath	High Hazard
Lower North Fork Smith	Low Hazard
Middle Fork Smith	Moderate Hazard
Middle Mad River	Moderate Hazard
Myrtle-Hardscrabble	Moderate Hazard
Red Cap Creek	High Hazard

Analysis Watershed Name	Road Hazard Potential
South Fork Smith	Low Hazard
Trinity-New to SF Trinity	High Hazard
Trinity-SF to Tish Tang	Moderate Hazard
Upper Little Van Duzen	Low Hazard
Upper Mad River	Moderate Hazard
Upper North Fork Eel	Low Hazard
Upper Van Duzen River	Moderate Hazard
Wooley Creek	Moderate Hazard
Ishi-Pishi	High Hazard

The primary opportunities to reduce surface erosion where needed:

- Increasing the number and effectiveness of drainage structures.
- Improving the road surface by either rocking, or adding a binding material to those roads that have native surfaces.

Drainage structure, function, and spacing are key to minimizing the amount of surface flow, which directly affects surface erosion. Subsequent project level Roads Analysis may consider new cross drain spacing guidelines using the Water Erosion Prediction Program (WEPP) to model surface erosion from roads have been derived (Morfin et al., 1996). The WEPP model provides for input ranges of local climatic conditions, surfacing material characteristics, maintenance frequency, distance between cross drains, and road grade typical for. National Forests. (USDA Forest Service, Water/Road Interaction Series, 1998).

Key Question

How and where does the road system affect mass wasting?

The sensitivity of an area to mass wasting depends on the interaction of the soils and underlying bedrock, slope steepness, and the subsurface hydrology. Much of the Forest is characterized as steep, mountainous terrain. Storm events and land management have had an effect on landslide rates throughout Northern California (HorseLinto/Mill/Tish Tang Watershed Analysis, 2000).

Road-related mass wasting can be attributed to 1) improper placement and construction of road fills and stream crossings, 2) inadequate culvert sizes to accommodate the peak flows, sediment loads, and woody debris, 3) roads located on soils susceptible to mass wasting, and 4) water diversion onto unstable hillslopes.

This indicator addresses the potential for altered sediment regime associated with mass wasting accelerated by disturbances such as roads and timber harvest. Road-related mass wasting potential is determined by examining the density of roads located on unstable geologic rock units (Table 7).

Table 7 Six Rivers Watershed Condition Assessment- Mass Wasting

Analysis Watershed Name	Mass Wasting Potential
Blue Creek	Moderate Hazard
Bluff Creek	High Hazard
Grouse-Madden	Moderate Hazard
Lower-Middle Klamath	High Hazard
Lower North Fork Smith	Low Hazard
Middle Fork Smith	High Hazard
Middle Mad River	High Hazard
Myrtle-Hardscrabble	Moderate Hazard
Red Cap Creek	High Hazard
South Fork Smith	Moderate Hazard
Trinity-New to SF Trinity	High Hazard
Trinity-SF to Tish Tang	High Hazard
Upper Little Van Duzen	Moderate Hazard
Upper Mad River	High Hazard
Upper North Fork Eel	High Hazard
Upper Van Duzen River	High Hazard
Wooley Creek	Low Hazard
Ishi-Pishi	High Hazard

The following is a list of opportunities to decrease the potential for road-related mass wasting:

- Design new roads to minimize large cut and fill areas across unstable ground.
- Increase capacity of road-stream crossings to better pass watershed products.
- Construct critical dips where diversion potential exists at stream crossings.
- Decommission unneeded roads that are located across unstable terrain.

Key Question
How and where do road-stream crossings influence local stream channels and water quality?

Culvert density reflects the extent to which roads have modified the channel network and the potential risk associated with culvert failures. The relatively low density of road-stream crossings across the Forest is attributable to the high proportion of roads on or near ridgelines where stream density is much lower. The consequences of culvert failures can be minor or substantial. Minor failures introduce culvert fill material that exceeds the transport capacity of the channel, causing the channel to aggrade and widen. It can take several years for the channel to adjust and move the sediment downstream, but generally the effects are localized. Some culvert failures generate debris flows that entrain additional sediment as they move downstream. The impacts from debris flows can be far removed from the original culvert failure and take many years for the channel to adjust and riparian vegetation to reestablish. Stream crossings on steep terrain, with a lot of

organic material upstream, have the greatest potential for debris flows. Adequate road maintenance is critical in these areas.

Culvert diversions also pose significant risks in terms of off-site sedimentation. Diversions occur when a culvert plugs and the stream flow follows the roadbed instead of crossing the road and returning to the original channel. When the stream flow eventually crosses the road, it can scour a new channel on the hillslope. Upgrading culvert size or constructing critical dips on the roadbed are necessary to minimize the diversion potential risks on needed roads.

Predicted road-stream crossings provide an estimate of the number of actual crossings. Predicted road-stream crossings are the points where roads and streams intersect based on GIS coverage (Table 8). Estimates may be actually higher or lower than predicted depending on accuracy of the stream or road coverage. The relatively low crossing density throughout the Forest is attributed to the majority of roads located in the upper third of the watershed where stream density is lower. Subsequent project level roads analysis should use field verified data to examine the actual road-stream crossing density of a 6^{th} or 7^{th} level watershed to more accurately identify areas of concern. The Forest has collected extensive culvert inventories in the following Watersheds: Camp, Slate and Ullathorn Creeks, Bluff Creek, Lower-Middle Klamath River, South and Middle Fork Smith River, North Fork Eel River, Grouse Creek, and Horse Linto Creek.

Table 8 Six Rivers Watershed Condition Assessment – Predicted Road-Stream Crossing Density

Analysis Watershed Name	Predicted Crossing Density (#/sq mi)
Blue Creek	0.54
Bluff Creek	0.58
Grouse-Madden	0.66
Lower-Middle Klamath	0.58
Lower North Fork Smith	0.39
Middle Fork Smith	1.17
Middle Mad River	1.06
Myrtle-Hardscrabble	1.04
Red Cap Creek	0.35
South Fork Smith	0.56
Trinity-New to SF Trinity	1.66
Trinity-SF to Tish Tang	1.0
Upper Little Van Duzen	1.32
Upper Mad River	1.40
Upper North Fork Eel	0.71
Upper Van Duzen River	1.59
Wooley Creek	0.08
Ishi-Pishi	1.79

Opportunities to improve areas of concern identified through project level roads analysis include:

- Designing crossings to meet the 100-year flow requirement.
- Decommission unneeded or abandoned roads.
- Construct critical dips on needed roads.
- Realign crossings that are not consistent with the channel pattern.
- Retrofit existing culverts to better pass watershed products.
- Add cross-drains near road-stream crossings to reduce connected ditch lengths.

Key Question
How and where does the road system create potential for pollutants, such as chemical spills, oils, de-icing salts, or herbicides, to enter surface waters?

Anywhere roads run adjacent to streams or floodplains, there is some potential for spilled pollutants to access streams. Generally, the greatest potential for pollutants to enter surface waters within the Forest is vehicle accidents that occur on State Highways 199, 299, 96, and 36. A wide variety of potentially hazardous materials are transported on these highways daily.

The Six Rivers has a policy of no herbicide use on the Forest. Some private land holdings within the Forest use herbicides for vegetation control which does create the potential for the introduction of pollutants on a very small scale across the Forest.

Key Question
How and where is the road system "hydrologically connected" to the stream system? How do the connections affect water quality and quantity?

All road-stream crossings provide a point of hydrologic connectivity, but the lengths of connectivity differ at each site. Cross-drains, waterbars, drainage dips, and other road drainage structures may be connected if the outlet of such features creates a gully that connects with the stream channel network. Connectivity also occurs when ditches or the road surface deliver directly to the stream at road-stream crossings. Roads cuts with long, continuous ditch lengths can intercept ground water, route it as surface water and may locally increase peak flows during storm events. Drainage ditches that are connected to road-stream crossings provide a conduit for road-related sediment to enter stream channels.

The Forest does not have extensive information about the proportion of roads that are hydrologically connected. As a first approximation, road-stream proximity (roads within 105 meters of stream) and the predicted road-stream density are displayed to indicate the extent of hydrologic connectivity within a watershed. Table 9 displays the density of roads near streams and the predicted road-stream crossings by watershed. Because of the variability in conditions and the variety of mechanisms that connect roads and streams, the information in Table 9 may not be accurate and is only intended to make comparisons between watersheds across the Forest. Subsequent project scale Roads Analysis should use information based on field observations to more accurately identify areas where the degree of hydrologic connectivity may be of concern.

Table 9 Six Rivers Watershed Condition Assessment – Estimated Degree of Hydrologic Connectivity

Analysis Watershed Name	Road-Stream Proximity (mi/sq mi)	Predicted Crossing Density (#/sq mi)
Blue Creek	0.21	0.54
Bluff Creek	0.22	0.58
Grouse-Madden	0.30	0.66
Lower-Middle Klamath	0.34	0.58
Lower North Fork Smith	0.27	0.39
Middle Fork Smith	0.63	1.17
Middle Mad River	0.49	1.06
Myrtle-Hardscrabble	0.60	1.04
Red Cap Creek	0.25	0.35
South Fork Smith	0.32	0.56
Trinity-New to SF Trinity	0.77	1.66
Trinity-SF to Tish Tang	0.48	1.0
Upper Little Van Duzen	0.42	1.32
Upper Mad River	0.70	1.40
Upper North Fork Eel	0.36	0.71
Upper Van Duzen River	0.73	1.59
Wooley Creek	0.03	0.08
Ishi-Pishi	0.67	1.79

Opportunities to improve areas of concern identified through project level roads analysis include:

- Add cross-drains near road-stream crossings to reduce connected ditch lengths.
- Decommission unneeded or abandoned roads.
- Place energy dissipaters at cross drain outlets to reduce erosion potential.

Key Questions

What downstream beneficial uses of water exist in the area? What changes in uses and demands are expected over time? How are they affected or put at risk by road-derived pollutants?

The Forest generates high amounts of water, mostly in the form of rainfall. The water is used for municipal and domestic supply, fisheries, agriculture, industry, recreation, hydropower, and maintaining riparian systems. Demands for high quality water are increasing. With increases in population, public and private lands recreation, agriculture, and industry, controversy over appropriate uses of water will also grow.

Some downstream beneficial uses can be affected by road-derived pollution. These are detrimentally affected if sediment from forest roads surpasses the tolerance of the fish and aquatic invertebrate populations or if roads cause channel instability, which degrades aquatic habitat.

The Pacific Southwest Region has worked on identification of management practices to protect water quality, and the development of a management program to implement identified practices. A cooperative effort between the Region and the California State Water Resources Control Board developed pollution control practices that meet the objectives of the Federal Clean Water Act.

As a result of this effort, approximately 100 nonpoint source pollution control practices were identified, many of which were specific to road construction and maintenance practices. This program, developed from 1975 to 1980, was certified by the State of California and approved by the Environmental Protection Agency and adopted as the Pacific Southwest Region Best Management Practices (BMPs). A subsequent management program was developed for BMP implementation.

Key Question
How and where does the road system affect wetlands?

Roads can affect wetlands directly by encroachment, and indirectly by altering hydrologic surface and subsurface flow paths. Encroachment results in a loss of wetland area directly proportional to the area disturbed by the road. Alteration of the hydrologic flow paths can affect wetland function with the effects extending beyond the area directly affected by the road. The LRMP provides measures to protect wetlands. Subsequent project-level analysis would identify specific areas where the road system may adversely affect wetland.

Where there are concerns, opportunities to reduce the effects of the road system on wetlands include the following:

- Relocate roads out of wetland areas.
- Where relocation is not an option, use measures to restore the hydrology of the wetland.
- Set road-stream crossing bottoms at natural levels of wet meadow surfaces.

Key Question
How does the road system alter physical channel dynamics, including isolation of floodplains, constraints on channel migration, and the movement of large wood, fine organic matter, and sediment?

Roads can directly affect physical channel dynamics when they encroach on floodplains or restrict channel migration. Floodplains help dissipate excess energy during high flows and recharge soil moisture and groundwater. Floodplain function is compromised when roads encroach on or isolate floodplains. This can increase peak flows. When peak flows increase, more water is available for in-channel erosion, which affects channel stability. Restricting channel migration can cause channel straightening which increases the stream energy available for channel erosion. This can also result in channel instability. Altering channel pattern affects a stream's ability to transport materials, including wood and sediment.

Resource specialists assessed floodplain connectivity across the Forest. Nearly all response reaches demonstrated properly functioning floodplain connectivity; however, the Upper Mad River Watershed was determined to be functionally at-risk, downstream of Matthews Dam.

Key Questions

How and where does the road system restrict the migration and movement of aquatic organisms? What aquatic species are affected and to what degree?

Migration and movement of aquatic organisms are primarily restricted at road-stream crossings with culverts. Generally the restriction is on upstream migration, although downstream migration can also be affected. Road-stream crossing features that can restrict fish migration include; inadequate jump pool depths and high flow velocities in culverts. In some locations, migration barriers may be desirable to protect native species. While culverts can affect the migration of amphibian species, the greatest concern is the effect on anadromous fish species.

The primary native species of concern are salmon and steelhead. There are no known anadromous fish migrations barriers associated with any Forest Road (Six Rivers National Forest Fish Passage Survey, 2001). A few road-stream crossings have been identified as potential barriers to resident fish in the Middle Fork Smith River, Trinity River- South Fork to Tish Tang, Blue Creek, and Trinity River- New River to South Fork. To what extent resident fish are affected by these possible barriers is unknown, and further analysis of these areas is a priority. In general, the location of the potential barrier is in the upper portions of the watershed and the extent to which resident fish are affected appears to be minimal.

Opportunities to correct migration barriers at road-stream crossings include:

- Replace the culvert with an alternative crossing such as bridge, hardened low-water ford, or bottomless arch culvert.
- Modify existing crossing to eliminate barrier where possible.

Key Questions

How does the road system affect shading, litterfall, and riparian plant communities?

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

Opportunities to address concern areas found in watershed or project level analyses include:

- Relocate roads out of riparian areas.

- Restore the hydrology in riparian areas that have been dewatered by the road system.

Key Question
How and where does the road system contribute to fishing, poaching, or direct habitat loss for at-risk aquatic species?

High traffic roads adjacent to streams with fish are the most likely to contribute to fishing and poaching. This is considered an important issue on the Six Rivers National Forest and may affect aquatic populations and at-risk aquatic species.

The road system contributes to direct habitat loss where mass movements associated with roads directly impact stream channels, where sediment is delivered directly to the stream channel at road-stream crossings, and where the road system is restricting channel migration and isolating floodplains. Opportunities to address problem areas would be similar to those previously identified.

Key Question
How and where does the road system facilitate the introduction of non-native aquatic species?

The introduction of non-native species occurs primarily through stocking of non-native fish. The California Department of Fish and Game coordinates stocking locations with the Forest Service to ensure that non-native aquatic species are not being introduced into waters containing native fish species or considered to be high quality habitat for native species reintroduction. Known stocking locations include Ruth Reservoir on the Mad River Ranger District; Fish Lake on the Orleans Ranger District; Island Lake, Dry Lake, Muslatt Lake, and Sanger Lake on the Smith River NRA (Department of Fish and Game, Trout Stocking Allotment, 2002).

Key Question
To what extent does the road system overlap with areas of exceptionally high aquatic diversity or productivity or areas containing rare or unique aquatic species or species of interest?

All seven river systems within the Forest contain high aquatic diversity and productivity. The road system overlaps many areas of exceptionally high aquatic diversity, including Critical and Essential habitat (as designated by the National Marine Fisheries Service) for Coho and Chinook salmon. The LRMP (which includes the Aquatic Conservation Strategy) provides standards and guidelines to protect aquatic resources.

B. Botany and Noxious Weeds

Key Questions:

Do areas planned for road construction, closure, or decommissioning have unique physical or biological characteristics, such as unique natural features and threatened or endangered species?

To what degree do the presence, type, and location of roads increase the introduction and spread of exotic plant and animal species, insects, diseases, and parasites? What are the potential effects of such introductions to plant and animal species and ecosystem function in the area?

Roads often intersect unique plant habitats. These include but are not limited to rocky outcrops, dry meadows, springs, seeps, and transient wetlands that are often isolated and favor the development of unique plant associations. As roads were built through these habitats, fill was often placed on top of existing habitat, effectively eliminating the habitat. Roads are also primary vectors for the introduction and spread of exotic plants, including noxious weeds. Road construction and maintenance allow for the establishment and dispersal of noxious weeds and plant-related diseases. People, animals, and machinery move noxious weeds and diseases from place to place. Roads provide constantly disturbed habitats with a lack of competing vegetation allowing for the establishment of exotic species. Roads provide an avenue for a host of exotic species located on the Forest to invade unique habitats and compete with native plants. Vehicles, livestock, and material (livestock food, road surfacing material, and firewood) transported to the forest from other locations can introduce new exotic species.

The Six Rivers National Forest Noxious Weed Risk Assessment has already been completed (FY 2001). Known locations of noxious weed on the Forest can be found in Appendix F.

C. Cultural Uses and Heritage Resources

Key Questions:
Do areas planned for road construction, closure, or decommissioning have unique cultural, traditional, symbolic, sacred, spiritual, or religious significance?

What, if any, groups of people (ethnic groups, subcultures, and so on) hold cultural, symbolic, spiritual, sacred, traditional, or religious values for areas planned for road entry or road closure?

How does the road system affect access to paleontological, archaeological, and historical sites?
How does the road system affect cultural and traditional uses (such as plant gathering, and access to traditional and cultural sites) and American Indian treaty rights?

Heritage resources on the Forest are varied and complex, ranging from 6,000- to 8,000-year-old prehistoric sites to historic mining ditches and cabins and administrative structures built by the Civilian Conservation Corps. Contemporary local Native

Americans continue to use Forest sites for ceremonial and religious purposes and to obtain a variety of natural resources for daily use.
Most Native Americans living in or near the Forest are descendants of the indigenous tribes that historically inhabited the area. Many local Native Americans continue to gather materials that were traditionally used by their ancestors. The gathering of these materials often has a spiritual significance as well as a practical one. Although many plants used by local Native Americans for basketry and food can be found in many areas of northern California, gatherers will often travel great distances to return to areas where they or their people have traditionally gathered. The availability and quality of materials traditionally used and access to traditional use areas is of great concern to Native Americans.
Roads can be both beneficial and detrimental to Native American traditional cultural uses. Use of roads, especially by elders, has become an accepted facet of traditional use and removal of an access road can cause concern among local tribal members. However, maintenance of access into these areas can also encourage use by other forest users, who may wish to utilize areas of cultural importance for recreational purposes. This can lead to conflict and requests for road closures or restrictions. Physical intrusion into contemporary use sites can result in disturbance through noise, disturbance or desecration of sacred objects, and the loss of solitude for prayer or ceremonies.

Tribal Trust Resources

The Forest Service has a trust responsibility to consult with Federally Recognized Tribes on management activities that may affect Federally Reserved Trust resources, rights, and tribal interests. The Forest Service has to be concerned where there are Federally Reserved Trust rights/resources, adjacent tribal lands or trust lands, tribal water rights, and other interests or concerns tribal governments may have.

The Forest has governmental relationships with Smith River Rancheria, Elk Valley Rancheria, Yurok Tribe, Resighini Rancheria, Big Lagoon Rancheria, Blue Lake Rancheria, Table Bluff Wiyot Reservation, Bear River Band of Rohnerville Rancheria, Round Valley Indian Tribes, Hoopa Tribe, and Karuk Tribe. The Forest initiated formal governmental consultation for the RAP with these Tribal governments to identify any potential affects to Federally Reserved Trust resources, rights, or tribal interests. No comments were received from any of the tribes.

The twelve local tribes have a variety of concerns about Forest management as related to their cultural activities. Maintaining access to traditional gathering or spiritual areas is of critical importance to local tribes (LRMP).

D. Social and Economics

Key Questions:

Social

How does road management affect wilderness attributes, including natural integrity, natural appearance, opportunities for solitude, and opportunities for primitive recreation?

How does road management affect people's sense of place?

What is the perceived social and economic dependency of a community on an unroaded area versus the value of that unroaded area for its intrinsic existence and symbolic values?

How does road management affect wilderness attributes, including natural integrity, natural appearance, opportunities for solitude, and opportunities for primitive recreation?

What are people's perceived needs and values for roads?

How does road management affect people's dependence on, need for, and desire for roads?

How is community social and economic health affected by road management (for example, lifestyles, businesses, tourism industry, infrastructure maintenance)?

Economic
How does the road system affect the agency's direct costs and revenues? What, if any, changes in the road system will increase net revenue to the agency by reducing cost, increasing revenue, or both?

How does the road system affect the priced and non-priced consequences included in economic efficiency analysis used to assess net benefits to society?

How does the road system affect the distribution of benefits and costs among affected people?

What is the perceived social and economic dependency of a community on an unroaded area versus the value of that unroaded area for its intrinsic existence and symbolic values?

Social

The three main issues that define the social climate are the protection of the environment, economic stability, and protection of cultural activities and values. The Forests primary zone of influence includes Del Norte, Humboldt, Trinity and Siskiyou counties. Diverse lifestyles and values exist in these zones of influence, yet they have one thing in common: Their lifestyles are intrinsically linked to the land and natural resources.

Local sense of place may be associated with areas such as spiritual or cultural sites, scenic vistas, hunting camps, and historic sites or traditional rural activities such as wood cutting and hunting. The community can also define local sense of place geographically. As with other social and economic issues and values, some "sense of place" issues are associated with access needs, while other are dependent on restricted road access. Increased access can result in social impacts.

Local sense of place includes social effects related to reduced job opportunities as a result of variations in traditional activities such as timber harvesting or grazing. For some people, these have been a way of life that has been passed down from generation to generation. These individuals have a strong sense of personal identity that revolves around these activities. For these individuals, the loss of these jobs not only means a loss of a source of income, but the loss of both a way of life and a sense of individual and cultural identity.

Economic and social value is also related to uniqueness and scarcity. Some dispersed recreational activities, backcountry, and wilderness activities are dependent upon restricted road access. Demand for developed use near population centers has put pressure on available dispersed areas for higher intensity use. This situation is resulting in increasing demand and associated value for the remaining primitive and semi-primitive recreational experiences associated with these areas.

Attitudes, beliefs, and values with respect to forest and road management reflect the full spectrum of diversity for both local and non-local groups. Some economic and social values are enhanced by increased access, while limiting access enhances others. There will be those who feel the benefit or the loss from every road management decision. Economic and social effects will be greater on local groups whose livelihoods and cultures are tied more closely to forest activities, thus resulting in more immediate and direct impacts to their daily lives.

Economics

The Forest directly influences the economy of Humboldt, Del Norte, and Trinity counties, and to a lesser degree, portions of Siskiyou and Josephine counties. The zone immediately surrounding Six Rivers National Forest is predominantly rural and highly dependent upon the Forest's natural resources for its social and economic well-being. These resources link the people and communities of this area to the Forest through employment, incomes, and environmental conditions that affect the lifestyles, population, and quality of life of the north coast region. Because of this, issues relating to transportation management and roads are frequently the focus of social concern.

Population density in these counties is less than 20 percent of the State average. Sixty-two percent of the population lives in rural areas or in small communities of 3,000 or less; 38 percent lives in the major population centers along the coast near Humboldt Bay and Crescent City. Population growth in the region is about half that of the State, with

much of this growth from retirees, urban flight, and expanding government and educational services.

Per capita income within the primary zone of influence is about 30 percent below the State average, due in part to lifestyles that include more self-sufficiency and employment in seasonal industries. Unemployment in the zone averaged 73 percent above the State level.

Various Forest outputs contribute to the health of the local economy: timber, recreation, fisheries and wildlife, range, and miscellaneous Forest products. The economic value of Forest outputs such as timber, commercial fisheries, and range can be quantified using market values or Forest usage fees. Other uses, such as sport fisheries, hunting, and many other recreation uses cannot be so easily measured.

Commodity outputs and associated Forest investments in maintaining and improving those outputs generate public and private sector employment. Employment incomes circulate through the local economy, generating indirect/induced employment and income in other sectors.

Forest investment in recreation, fisheries, and wildlife present opportunities to increase contributions to the local economy from these non-commodity outputs such as increased recreation, commercial and sport fishing, hunting and non-consumptive wildlife uses.

The road system is a key component of the social and economic functioning of communities around SRNF. The major effects of roads on local economies would be expected to result from the economic activity that roads support by providing access to the National Forest and to communities in or near it. Roads affect spatial patterns of forest use. The majority of recreational and tourism users are particularly attracted to or driven away from certain areas by the availability and ease of access. Road availability and quality also affect the quality of users' experiences, and thereby affect the benefit they receive. Social and economic issues and values can be driven by access needs, but they can also be dependent upon restricted road access. As with other issues, what some value as a need, others perceive as an impact.

E. Fire Suppression and Fuels Management

Key Questions:

How does the road system affect fuels management?

How does the road system affect the capacity of the Forest Service and cooperators to suppress wildfires?

How does the road system affect risk to firefighters and to public safety?

Aggressive fire suppression activity across the Forest over the last 80 years has resulted in unnatural fuel profiles that are more continuous, both horizontally and vertically. Given a fire start, resulting wildfires could become larger and more destructive than in the past. Substantial mortality is occurring in certain vegetation types, creating large expanses of snag patches and dead fuels.

Comparing the periods pre-and post-1950, actual fire starts have increased dramatically both for lightning and human causes since 1950. This can be explained by several factors, including increased detection efforts, increased road access, and more efficient reporting. Recent trends in human causes still tend to cluster along major highways and near communities and developed campgrounds. Human causes have accounted for the largest total acreage and number of wildfires for the recorded fire history of the Six Rivers National Forest (1910- present). However, lightening occurs frequently throughout the forest, often with multiple ignitions from the same storm. Multiple lightning starts played a significant part in the 1987 wildfires and the recent Megram Fire, which was the largest recorded wildfire on the forest.

Roads provide access not only for accomplishing the protection side of the fire management, allowing rapid response and safe deployment of firefighting resources, but also for fuels treatment to prevent catastrophic fire. Roads can be an impediment to fire spread at low fire intensity levels by acting as fuel breaks, which can aid in fuel treatments and suppression efforts. Roads provide a means for efficiently and safely transporting firefighters, materials and equipment.

Communities and other private landowners depend on the Forest for wildland and structure fire suppression services. The road network in support of these private parcels will be a key component of protecting private lands and structures. Roads serve as escape routes for area residents in the case of fire emergency.

The Six Rivers National Forest Fire Management Plan (FMP) was completed in FY 2001, and identified key areas of concern across the forest. The road system will permit the efficient reintroduction of fire by having fuels breaks already in place. These breaks will provide a safer means for managing prescribed fire by reducing risk of an escape. They also represent safety zones for firefighters engaged in suppression and hazardous fuels reduction work.

F. Port-Orford Cedar

Key Question
To what degree do the presence, type, and location of roads increase the introduction and spread of exotic plant and animal species, insects, diseases, and parasites?

The spread of Port Orford cedar (POC) root disease (*Phytophthora lateralis*) is mostly facilitated by the use of roads during wet weather. POC root disease is a water-borne fungus that is spread primarily by vehicles that transport mud and the spores from infested sites to new locations. This disease can kill entire stands of POC.

Vehicular access for both the public and Forest Service personnel is a concern within the Port-Orford-cedar range due to the potential spread of Port-Orford-cedar root disease into uninfected drainages. Although non-vehicular sources (pedestrians, animals) can spread the disease, vehicles travel greater distances and potentially run a greater risk of contacting infected waters as compared to non-vehicular sources. Infection of more tributaries by the root disease would result in a loss of diversity in those botanical areas that support Port-Orford-cedar. Port-Orford-cedar is present on the Smith River National Recreation Area and the Orleans and Lower Trinity Ranger Districts.

Since the spread of the disease is primarily connected to the activities of humans during wet periods, the forest has been assessing, and will continue to assess the need for seasonal or permanent road or trail closures in areas where such closures would help to reduce or prevent the spread of the disease.

The threat from Port-Orford-cedar root disease, its limited distribution, wide environment gradients, high genetic diversity, high social values, importance to wildlife, high species and community diversity point towards the need for a conservation strategy designed to maintain the ecological and economic viability of POC (USDA, USDI 2001; Jimerson and Jones 2002).

G. Recreation

Key Questions:

Unroaded Recreation
Is there now or will there be in the future excess supply or excess demand for unroaded recreation opportunities?

Is developing new roads into unroaded areas, decommissioning of existing roads, or changing the maintenance of existing roads causing substantial changes in the quantity, quality, or type of unroaded recreation opportunities?

What are the adverse effects of noise and other disturbances caused by developing, using, and maintaining roads, on the quantity, quality, and type of unroaded recreation opportunities?

Who participates in unroaded recreation in the areas affected by constructing, maintaining, and decommissioning roads?

What are these participants' attachments to the area, how strong are their feelings, and are alternative opportunities and locations available?

Roaded Recreation
Is there now or will there be in the future excess supply or excess demand for roaded recreation opportunities?

Is developing new roads into unroaded areas, decommissioning of existing roads, or changing maintenance of existing roads causing substantial changes in the quantity, quality, or type of roaded recreation opportunities?

What are the adverse effects of noise and other disturbances caused by constructing, using, and maintaining roads on the quantity, quality, or type of roaded recreation opportunities?

Who participates in roaded recreation in the areas affected by road constructing, changes in road maintenance, or road decommissioning?

What are these participants' attachments to the area, how strong are their feelings, and are alternative opportunities and locations available?

Almost all of the varied types of public recreational uses of National Forests depend in one way or another on roads for access. Whether, when, and where various recreational uses occur depend on the availability of access to, and the extent and location of, the road system. Maintaining a viable road system is the key to our ability to providing diverse recreation opportunities. However, the existence and/or condition of roads may contribute to overuse and, ultimately, a diminishment of visitors' recreation experiences.

The Forest has a variety of recreation opportunities ranging from large, remote undeveloped areas (wilderness) to small, easily accessed and highly developed sites (campgrounds). The existing road system provides relatively easy access to all recreation areas, developed and dispersed, commensurate with the operational and development level of the recreational opportunities we provide.

The Forest has over 366 miles of Wild and Scenic Rivers. Most of these areas have road access within the river corridor. The public generally considers these roads essential for recreation. The Forest also has approximately 121,000 acres of congressionally designated Wilderness (approximately 13% of forest), providing settings for quality unroaded recreation. Road access to wilderness trailheads provides management opportunities for dispersing use into the wilderness.

Both developed recreation and some dispersed recreational activities are dependent upon road access for use. Demand is expected to increase in proportion to population growth both within the sphere of influence and nationally for dispersed low use areas due to the increasing difficulty of finding this type of recreational experience close to urban areas.

Altering road systems can disrupt long-established access and use patterns and, at least in the short term, result in not meeting visitors' expectations. Less road mileage, maintenance, or both can lead to uneven shifts in recreational opportunities across different user, socioeconomic, and ethnic groups who depend differently on roads for access.

Road access or lack of access will affect recreational opportunities and users depending on the individual's preferences, experience and expectations. Those recreationists involved in activities that require road access, (ie. access to their favorite hunting/fishing area) or who are dependent on motorized transport, will require a maintained road system. Impacts from road management decisions will be different for individuals who prefer to walk or ride all terrain vehicles (ATVs), bicycles, or horses into these areas.

The network of Forest roads provides many opportunities for users to access developed recreation facilities as well as remote locations of the Forest. These remote sites are referred to as dispersed recreation sites and are located throughout the Forest. Driving for pleasure and viewing scenery account for the greatest amount of recreation use on the Forest (LRMP).

Overall, motorized recreation is on the increase and coordinated efforts at various local, state, and federal levels are using forest roads to increase rural tourism attractions and revenues. Rural communities support the designation of specialized routes (such as OHV routes, or scenic byways) and motorized events and promote them as tourism attractions and potential sources of revenue.

The Six Rivers National Forest currently provides a road system that accesses both roaded and unroaded recreation opportunities. Based on the Land Resource Management Plan and projections, the current system should satisfy future needs for primary access.

H. Research and Monitoring

Key Questions:

How does the road system affect access needed for research, inventory, and monitoring?

Research, inventory, and monitoring projects are important components of responsible land management. Research activities can provide answers to important questions relevant to management for ecosystem health. Inventories provide information needed to measure current conditions, detect trends, and identify problems. Monitoring is essential for evaluating whether management objectives are being met.

Some of the common types of Research and Monitoring activities conducted include existing vegetation inventories; Threatened, Endangered, and Sensitive species occurrence; Survey and Manage Species occurrence; historic properties surveys; and plantation exams. Monitoring activities are also a regular component of the Forest program of work. Significant activities include LRMP implementation monitoring and Best Management Practice (BMP) monitoring for many types of activities. In addition, the close proximity of the Pacific Southwest Research Station (Redwood Sciences Laboratory) and Humboldt State University to the Forest provides extensive opportunities for research to occur.

Field costs are often a significant proportion of the total costs for such efforts, while road access or proximity to roads is an important component of field costs. A reduction in road density or elimination of road access to specific geographic locations can limit research, inventory, and monitoring activities.

I. Special Uses, Mining Access, Range, Fuel wood, and Miscellaneous Products

Key Questions:

How does the road system affect access to locatable, leasable, and salable minerals?

How does the road system affect access to range allotments?

How does the road system connect to public roads and provide primary access to communities?

How does the road system connect large blocks of land in other ownership to public roads (ad hoc communities, subdivisions, inholdings, and so on)?

How does the road system address the safety of road users?

How does the road system affect managing roads with shared ownership or with limited jurisdiction (RS 2477, cost-share, prescriptive rights, FLPMA easements, FRTA easements, DOT easements)?

Tax receipts from forest-related activities such as yield taxes, sales tax, transient occupancy taxes, and property taxes generate revenue. Roads provide access to permitted uses (recreation, minerals, range, outfitters and guides, transmission lines, etc.) on public lands. All of these activities provide revenue directly and indirectly to the counties. In addition, roads provide access to private lands for income generating activities such as recreation, timber, and livestock production. Without economical access, existing and future development and revenue may be constrained on these private lands. Other common uses of roads include hunting, Off Highway Vehicles, snowmobiles, driving related and other dispersed recreation. Social and economic needs include administrative use such as inventory and monitoring, and law enforcement. Community needs include health and safety, and connectivity between communities or neighborhoods.

The Forest road system also provides access for fuel wood and miscellaneous plants and materials collection, and a wide variety of special uses. The local communities benefit from the products found on the National Forest, both socially and economically.

Some traffic on forest service roads is authorized by rights contained in easements, specific agreements, permits, or contracts (FSM 7731.13). The following are types of authorizations:

1. Roads Authorized By Special Use Permit

2. Roads Covered by Road Right-of-Way Construction and Use Agreements
3. National Forest Timber Sale Traffic
4. Roads Under License Agreement or Memorandum-of-Understanding

In addition, the Forest Service must provide access for owners of private property. The Forest Service cannot deny reasonable access over existing forest development roads to any person desiring to reach their private land holdings within the boundaries of National Forest System lands. Roads may be closed to general use; however, resident property owners should have access over the closed roads.

J. Vegetation Management

Key Questions:

To what degree does the presence, type, and location of roads contribute to the control of insects, diseases, and parasites?

How does the road system affect managing the suitable timber base and other lands?

How does the road system affect access to timber stands needing silvicultural treatment?

Vegetation management includes timber harvest; plantation management; forest health issues (such as insect infestation removal or POC protection); and thinning or brush reduction to meet other resource objectives (such as fuels reduction or habitat improvement).

The Forest roads system provides access to areas of Forest Matrix lands (lands allocated for timber production) and to large areas of plantations needing treatment. Continued access to the Matrix is a priority if the goals for timber harvest described in the LRMP are to be met. Plantations require continued management for survival and growth, which is essential to protecting the substantial investment they represent.

Silvicultural treatments may include site preparation, initial planting, re-planting if necessary, pre-commercial thinning, and commercial thinning. Improvement treatments may involve hand or mechanical release methods. While road access is not absolutely required for the accomplishment of these treatments, it is a significant determinant of cost and feasibility. Recent management practices using extensive thinning require more frequent treatments and thus more frequent access. In addition, overstocked, small diameter stands can generally only be economically treated if they are adjacent to roads. Finally, fuel reduction treatment methods may be limited without direct road access and a cleared road prism for use as a control feature. Mechanical fuel reduction methods are typically only feasible where stands are immediately adjacent to roads. Elimination of road access may directly limit uneven-aged management treatment methods.

K. Wildlife

Key Questions:

What are the direct effects of the road system on terrestrial species habitat?

W*hat are the adverse effects of noise caused by developing, using, and maintaining roads?*

Roads have impacts on wildlife and wildlife habitat that are disproportionate to the area of land they occupy. The Forest road system and human use of those roads has altered terrestrial species habitat and populations. Negative effects can include habitat loss and fragmentation; avoidance or road kill; poaching, and over harvest. Roads can also undermine ecological processes through fragmentation of wildlife populations, restrictions of wildlife movements, and the disruption of gene flow and metapopulation dynamics (Jackson 2000).

Roads and past timber harvest are major causes of forest habitat fragmentation on the Forest. Habitat quality can be reduced by breaking up blocks of continuous habitat and increasing the amount of edge habitat, which is detrimental to species that require interior habitat conditions (Marcot et al. 1994, Forman 1997, Hann et al. 1997).

Natural populations of animal species are affected by the presence of roads by avoidance by some species and attractiveness to them by others. Roads and their adjacent environment qualify as a distinct habitat and can result in a change at the species, population, and landscape scales. Some species are associated with edges, including those that use roads as corridors to find food. Roads facilitate invasion by exotic species or of native species attracted to new habitat areas (i.e. nest parasites) that can disrupt the structure and function of the ecosystem (Jackson 2000; USDA 2000).

Roads can also act as a barrier to terrestrial species movement. When populations of less mobile species (such as amphibians) become subdivided, there is increased risk of local extinction of subpopulations, reduced potential for recolonization after a local extinction, and a progressive loss of local biodiversity (Forman and Hersperger 1996).

Road access can also facilitate harassment, in terms of noise disturbance during the breeding season. Harassment can lead to reductions in productivity or displacements in population distribution or habitat use. Many species also are vulnerable to increased mortality from highway accidents with motorized vehicles (Vestjens 1973).

In summary, most native terrestrial species located on the Forest are adversely affected by road-associated factors that can degrade habitats or increase mortality. In landscapes with moderate to high road density, habitats are likely underused by many species that are negatively affected by road-associated factors.

On the other hand, the Forest road network can facilitate habitat protection and improvement projects. Habitat improvement projects that involve the use of equipment and/or personnel can be accomplished more safely, in less time, and with less expense

provided there is adequate road access. Roads can help protect forest habitats by providing access for initial attack on wildfires, acting as firelines, and providing safe deployment areas for fire fighting personnel. Population studies and long term research and monitoring projects are also facilitated by access to habitat areas.

The Forest has decommissioned 212 miles of roads since 1995 (with an additional 9 miles scheduled for 2002), the majority of which are OML 1 and 2. This has helped reduce habitat fragmentation and disturbance to wildlife across the Forest. Additional roads analysis at the watershed scale may identify further opportunities to improve wildlife habitat conditions through decommissioning.

Chapter V. Step 4 -Assessing Benefits, Problems, and Risks

Forest Scale Roads Analysis

Interdisciplinary teams on each Ranger District evaluated each OML 3, 4, and 5 road for administrative need and potential resource risk, using existing GIS layers and resource-specific databases. Each resource evaluated the roads based on first the general criteria (Appendix G) and then using the more specific criteria (below). The combined rating results are summarized in Table 5 for each District. Administrative need was determined based on the access required for recreation; cultural use; fuels treatment and fire suppression response; timber production and other vegetation management; biological research, inventory and monitoring; private property access; mining; range allotments; habitat improvement projects; and special use permits. Resource risk was evaluated based on the potential for impacts to aquatic resources; wildlife and botany species and habitats; cultural resources; and the risk of introducing or spreading Port Orford cedar root disease. The risk ratings were assigned to roads in their entirety, even though the rating may be based on a single known nest site or plant location. All resource ratings had equal value; in other words, no one resource carried more weight. In many cases a road has both a high administrative need and a high resource risk. Recommendations were developed based on the results of these analyses. It is important to note that Forest-scale RAP does not compel a Forest Plan amendment or revision (FSM 7712.12a).

Watershed Scale Road Analysis

Roads analysis below the Forest-scale is not automatically required, but may be undertaken at the discretion of the Responsible Official. (FSM7712.13c). The next step in the Roads Analysis Process would be to evaluate unclassified and maintenance level 1 and 2 roads at the watershed scale. Lower-scale analysis will be conducted using the criteria listed below, as well as those listed in Chapter IV, Step 3 under the Watershed Processes and Aquatic Resources section. The objective for watershed scale roads analysis is to provide specific information for future management decisions that attempt to balance the needs for access with the environmental risks associated with roads. Watershed scale road analysis it will be done as funding allows.

Table 10 lists watershed priorities for completing subsequent roads analyses as established by the Forest Supervisor, although scheduling is dependent on budget and other Forest priorities. Watershed scale roads analysis will identify problems and risks for all roads, areas of special sensitivity or resource values, and suggest priority locations for road decommissioning and upgrading. These assessments and subsequent project NEPA and project implementation will be accomplished as funding levels allow.

Table 10 Watershed-Level Roads Analysis Schedule

Watershed	District
South Fork Smith River	Smith River NRA
Lower Middle Klamath	Orleans
North and Middle Forks Smith River	Smith River NRA
Dillon and Rock Creeks	Orleans
North Fork Eel, Upper Mad River, Middle Mad, Upper Van Duzen	Mad River
Blue Creek	Orleans

Evaluation Criteria

1. Evaluation Criteria for Watershed Processes and Aquatic Resources

Analysis of the major transportation system as part of the Forest-scale roads analysis relies on existing information and the use of the following road hazard indicators:

1. Roads located on steep hillslopes,
2. Roads located on weak or sensitive bedrock geology,
3. Roads on low or middle slope position.

The purpose for this assessment was to identify roads that may have a higher risk of failure and where upgrading practices would be appropriate to protect downstream aquatic resources.

Hillslope Class
The frequency of road failures can be partially attributed to the slope of the hillside of which the road crosses. Analysis of past road failures have indicated that the ratio of failures per mile was about 8 times greater for roads located on hillslopes greater than 50 percent. Hillslope class is separated into categories of 0-20 percent, 20-50 percent and greater than 50 percent.

Bedrock Geology
Bedrock geology is the parent material on which soils and vegetation develop. Roads constructed on different bedrock types will often have differences in susceptibility to mass wasting. Bedrock units considered to have a high susceptibility to mass wasting on the forest are: Galice metasediments, Franciscan schist, Franciscan mélange, and Rattlesnake Creek Terrane. Areas with a high percentage of roads on geologically sensitive lands are more vulnerable to accelerated landsliding and catastrophic loss of the road facility.

Hillslope Position
This indicator can be useful in evaluating road hazard in mountainous terrain. Investigations on the Six Rivers have indicated that road failures are about 30 times higher in the lower hillslope position as compared to the upper hillslope position. Generally, the uppermost position is the driest and most stable location on the hillslope. For this analysis, hillslope position was divided into three categories by assigning 25 percent of the acreage to the upper position, 50 percent to the middle position, and the remaining 25 percent to the lower position.

Aquatic risk rating criteria:

1. Is the road located on slopes greater 50 percent?
2. Is the road located on weak or sensitive bedrock geology?
3. Is the road located in the lower or middle hillslope position?

A road-by-road assessment was conducted using GIS-based queries to determine the total road mileage of overlap for each road hazard indicator. Resource specialists that have extensive knowledge of road conditions and problem areas on the Forest evaluated results. Final ratings of high, moderate, and low were not only determined from the initial queries, but also incorporated past road-related failures, road maintenance problem areas and overall condition of the road's drainage structures. Results of the initial queries validated much of the initial assumptions made about road conditions; that is, the roads with chronic problems rated higher than other roads. Final ratings are included in the Roads Assessment Tables (Chapter IV). The Road Assessment tables also contain specific road information with respect to unstable road sections and upgrading or storm proofing opportunities.

2. Evaluation Criteria for Botanical Areas and TES Plants

The purpose for the criteria is to identify roads that provide access for management of botanical resources or that may impact unique resources in Botanical areas and in threatened, endangered, and sensitive (TES) plant species habitat.

Step 1 Evaluate the road in terms of the criteria listed below to determine the level of need for the road, as well as the need for corrective measures to help reduce risks.

1. Does the road provide access to or within a Botanical Area or TES suitable habitat areas?
   If yes, then:
   a. Is it the main or only road that accesses the Botanical Area or TES suitable habitat areas?
   b. What is the level/intensity of use?
   c. Does the road access unique features or points of interest within the Botanical Area?

2. Is the road currently impacting resources or posing a threat to the unique resources/features within the Botanical Area or TES suitable habitat areas?
   If yes, then:

a. What is the level of risk of introducing or exporting POC root disease?
b. Is the road altering drainage patterns in a way that negatively affects plant communities or other unique features?
c. Does the road lead to an environmentally sensitive area in which we may want to discourage use (e.g. population of a unique plant community that is limited in its extent)?
d. Is there evidence of cross-country travel off the road?

3. Risk Assessment of Port-Orford-cedar Plant Associations

The risks to POC were analyzed at the Forest level. The landscape level risk assessment utilized the POC plant association mapping (extent of each plant association, disease extent), the risk of POC root disease introduction drawn around mapped POC polygons and the assessment of potential impacts to other resources such as fish, wildlife, and cultural resources. These factors are combined to give an overall landscape level risk assessment of the potential to affect POC plant association biodiversity, genetic diversity or economic diversity. For example, a POC plant association found in riparian positions with close proximity to roads and limited protection measures that had a significant degree of infestation would have a high-risk rating. The risk rating for each road was assigned based on the proximity of the road or trail to POC plant associations.

The assessment of the risk of introduction of the POC root disease was based on the presence of upstream infection, proximity to streams and roads, seasonal or permanent road closures, and location in protected areas such as wilderness. The POC mapping work was updated to include risk (high moderate, and low) polygons rating the potential for introduction of POC root disease. Risk polygons were drawn around each sub-watershed and labeled according to the categories listed below (Rose and others 1999).

Low Risk:
Uninfested POC stands, which are in congressionally or LRMP designated areas such as wilderness, roadless areas, or Research Natural Areas, with no roads within 500 ft of any part of the stand.

Uninfested POC stands, in any land designation, with no roads within 500 ft of any part of the stand.

Moderate Risk:
Uninfested POC stands protected by a permanent barrier.

Uninfested POC stands protected by a seasonal gate or barrier.

High Risk:
Uninfested POC stands in watersheds with no identified protection.

Infested POC stands

4. Evaluation Criteria for Fish and Wildlife

The purpose for the criteria is to identify roads that provide access for management of fish and wildlife resources or that may impact unique resources in special habitat areas or threatened, endangered, and sensitive (TES) fish and wildlife species.

Step 1 Determine the primary need for the road*:*

1. Habitat Improvement Projects
   a. Does the road access an existing habitat improvement project that needs monitoring on a regular basis?
   b. Does the road access a planned habitat improvement project, scheduled within the next 10 years?

2. Monitoring/survey efforts
   a. Does the road provide access to an existing territory/survey site that requires frequent monitoring (such as peregrine falcon nest sites, spawning areas, etc.)?
   b. Does the road provide access to large habitat areas (such as LSRs) that may need future monitoring?

Step 2 Establishing the primary need for the road will help to determine the importance in relation to Fish and Wildlife Management programs**.**

1. Is there more than one road that leads to this area?
2. What is the quality/importance of this site in relation to others on the District?
3. Are there other viewpoints or ways to access the site (trail)?

Step 3 Give the road an overall "need" rating based upon the answers to the above questions.

> High: the road is the only feasible access to a high quality existing territory/survey site/index streams reaches/large LSR, planned (and funded) habitat improvement project, or an existing habitat improvement project requiring monitoring;
> Medium: the road accesses one of many similar survey sites on the District, accesses an existing habitat improvement project that does not require monitoring, or accesses a planned (but unfunded) habitat improvement project site.
> Low: the road is one of several access routes/viewpoints into any area described above.

Step 4 Determine potential resource risk associated with road access:

Determine potential effects to Special Habitat Areas and/or Riparian Reserves.

1. Does the road go through Management Area 8 (Special Habitat) or Mgt Area 9 (Riparian Reserves)?

- Late-Successional Reserves
- Bald Eagle Nest Site Protection Zone and Winter Roost Areas

- Peregrine Falcon Nest Site Protection Zone
- Occupied Marbled Murrelet Sites
- Known Spotted Owl Activity Centers
- Protection buffer Species Areas
- Road allows vehicle access near salmonid spawning areas and potential for poaching
- Road allows/facilitates streambank camping and potential disturbance to vegetation and sensitive riparian/aquatic species

Determine potential effects to Managed Habitat Areas.

1. Does the road go through Management Area 14 (South Fork Marten Area).
2. Does the road go through a Survey and Manage site?
3. Does the road go through a northern goshawk primary nest zone?
4. Does the road go through key black-tailed deer areas (critical wintering areas)?
5. Does the road go near (less than 0.25 mile) a cave/known roost site of Townsend's big-eared bats or other bat species?
6. Does the road go near a known fisher, marten, wolverine or other species of interest/concern nest/den?
7. Does the road increase the potential for poaching from a sensitive habitat area?

Step 4 Give the road an overall "risk" rating based upon the answers to the above questions.

> High: Road directly accesses occupied special/managed habitat areas and has the potential to introduce disturbance during critical nesting/spawning periods
> Medium: Road indirectly accesses occupied special/managed habitat areas and the potential to introduce disturbance is less.
> Low: Road is not in any territories, habitat areas, Riparian Reserves, or the area is not currently occupied, or the site currently has a high background level of disturbance from other factors (e.g. existing campground, state highway, etc).

5. Evaluation Criteria for Fire and Fuels Management

The purpose for the criteria is to identify roads that provide necessary access for fire suppression activities and fuel treatment areas.

Step 1 Determine the primary purpose of the road*:*

1. Is the road a primary access point for suppression efforts?
   If yes, then:
   a. Is there more than one road that leads to this area?
   b. Is this road important for suppression capabilities (i.e. numerous historical lightning starts, access to areas with critical fire control problems, etc.)?

   Rating:

High: only 1 access or fastest response time to a certain area
Moderate: 2-3 roads access an area
Low: 4 + roads access an area

2. Does the road accesses existing or proposed developments for suppression efforts?
   If yes, then:
   a. Is there more than one development that the road leads to?
   b. Are any developments planned along this road in the short-term (0-5 years)?
   c. Are there any developments that have not been used or the access roads are overgrown?

   If so, evaluate whether they are actually still needed.

   Rating:
   High: primary developments are located or planned to be located along this road. No other developments are available along this road.
   Moderate: several developments located at various intervals along the road. Not all developments are needed.
   Low: developments located along the road but are rarely used or the roads to them are becoming overgrown or impassable.

3. Does the road provides access to or serves as a control line for residential areas?
   If yes, then:
   a. Is the road the primary ingress/egress for these residential areas?
   b. Does the road serve as a control line in protecting these residential areas?

   Rating:
   High: primary ingress/egress and/or road serves as control line.
   Moderate: one of several roads which leads to a residential area or can potentially be used as a control line.
   Low: does not provide access or could not be used as a control line for a residential area.

4. Does the road provide access to areas requiring fuel treatments?
   If yes, then:
   a. Is the road the primary access for areas requiring treatments for which BD/KV collections were made?
   b. Is the road the primary access for areas where natural fuels treatments are planned or proposed?
   c. Are there additional opportunities in the long-term (5 + years)?

   Rating:
   High: primary access to fuel treatment areas within the short-term (0-5 years).
   Moderate: one of several roads which provides access to fuel treatment area.
   Low: road does not provide access to fuel treatment areas in the short-term.
   Road may be needed for access in the long-term (5+ years).

5. Does the road serve or will it serve as an established fuelbreak?
   If yes, then:

a. Does the road serve as an established fuelbreak where fuel treatments have been completed within the past 5 years?
b. Are fuel treatments proposed along this road within the short-term (0-5 years) which will act as fuelbreaks?

Rating:
High: fuel treatments have been accomplished or are planned along either side of the road in the short-term (0-5 years).
Moderate: one of several roads within the area with established or planned fuelbreaks however additional fuels work is needed to maintain the effectiveness of the fuel break.

Low: road is not used as a fuelbreak. A fuelbreak may be planned in the long-term (5+ years).

Step 2 Give the road a high, medium, or low rating for one or more of the purposes and an overall rating based upon the answers to the previous questions and your knowledge of the District's current and future fire suppression and fuels treatment programs.

6. Evaluation Criteria for Recreation Management

The purpose for the criteria is to identify roads that access a recreation facility or are a component of the Recreation Opportunity Spectrum (ROS).

Step 1 Determine the primary purpose of the road:

1. Does the road provide access to a recreation facility or opportunity?
   If yes, then:
   a. Is there more than one site/opportunity that the road leads to?
   b. What is the quality of the site/facilities?
   c. What is the level and intensity of use?
   d. Are there similar opportunities elsewhere that would provide the same/similar experience?

   Rating:
   High: This is the only access to a facility or the opportunity occurs only here.
   Medium: There is more than one access and the opportunity occurs only here.
   Low: There are many accesses or many similar opportunities occur elsewhere.

2. Is traveling the road the recreation experience?
   If yes, then:
   a. Is it a specially designated road (i.e. Scenic Byway, Backcountry Discovery Trail)?
   b. Is it a noted scenic route?
   c. Is it an off-highway vehicle (OHV) travel way or does it lead to OHV 'greensticker' routes?
   d. Is it a loop road or part of a loop?
   e. Are there some primary activities that occur while people drive the road (i.e. birding, pleasure driving, road hunting, wildflower viewing)?
   f. Is the road used as a mountain bike route?
   g. What is the intensity of use of the road?

h. Is this an important road to the district/forest recreation spectrum?
i. Does this road offer some unique recreation experience that is not available anywhere else on the district or forest?

Rating:
High: The road provides a unique opportunity not available elsewhere on the forest.
Medium: A similar opportunity occurs on the district.
Low: Many opportunities occur on your district.

7. Evaluation Criteria for Roads Associated with Vegetation Management

The purpose for the criteria is to identify roads that are needed for implementation of vegetation management practices on the Six Rivers National Forest.

Step 1 Determine the primary purpose of the road:

1. Does the road access treatable stands within sub-series, and seral stages in matrix lands?
   If yes, then:
   a. Does the road access multiple opportunities (stands)?
   b. Are there additional opportunities in the next 10-20 years?
   c. Are there special forest product areas accessed by this road?

2. Are the plantations requiring reforestation or other silvicultural treatments (including PCT) within 10 years?
   If yes, then:
   a. Does the road access multiple plantations?
   b. How long until treatments will be completed (how long is the road needed)?

3. Does the road access treatable sub-series and seral stages within a Late-Successional Reserves (LSR)?
   If yes, then:
   a. Does the road access multiple opportunities (stands)?
   b. Are there additional opportunities in the next 10-20 years?

4. Are there plantations within LSR requiring silvicultural treatments and have available funding?
   If yes, then:
   a. Does the road access multiple plantations?
   b. Does the plantation have available KV funding?
   c. How long until treatments will be completed (how long is the road needed)?
   d. Is it near treatable sub-series and seral stage stands that may generate KV funding?

Step 2 Assign the risk to Port-Orford-cedar using the Forest POC Risk Assessment document.

Step 3 Give the road a high, medium, or low rating for one or more purposes and an overall rating based on the answers to the previous questions and your knowledge of the district's current and future need for vegetation management.

8. Evaluation Criteria for Roads Associated with Special Use Permits, Range, and Mining Claims

The purpose for the criteria is to identify roads for private individual and administrative access for special uses, range, and mining claim activities and the risk associated with access to these areas.

Step 1 Determine the primary purpose of the road:

1. Is the road use is authorized under a special use permit or easement?
   If yes, then:
   a. Is the road needed for current authorized use under a permit or easement?
   b. Is the use planned to be authorized as a new permit or a reissuance of an expired permit?
   c. Is the road expected to be needed after current permit expires?
   d. Will the permit be reissued considering current resource concerns or changes in future management of the area?
2. Is the road is used for access to an authorized (or an activity in the process of being authorized) special use activity or legally filed mining claim with current assessment?
   If yes, then:
   a. Will permit be reissued following stated termination date?
   b. Is the use appropriate based upon current management guidelines in the area?
   c. Are alternatives access routes available on private lands that are more appropriate?
3. Is the road is used for access without authorization?
   If yes, then:
   a. Would current use meet criteria for authorization of a special use permit (FS road is sole access to property)?
   b. Does current use damage resources?
   c. Does road meet other resource needs besides that of current user(s)
4. Is the road is used for access to private land or activities on National Forest land for which there is NO special use authorization or legally filed mining claim with current assessment?

Step 2. Give the road a high, medium, or low rating for one or more purposes and an overall rating based on the answers to the previous questions.
9. Evaluation Criteria for Roads with Heritage and Cultural Resources

When rating a road for its Heritage and Cultural Resources priority in the roads analysis planning effort, the following steps need to be considered in developing the assessment.

Step 1 Determine the primary purpose for the road and answer each of the sub-questions:

1. The road provides access for interpretation of heritage resource values.
   a. Does the road provide access to interpretive sites?
   b. Does the road provide access to a potential interpretive site?

2. The road provides access to traditional cultural properties.
   a. Does the road provide access to a known traditional cultural property?
   b. Is there an existing MOU or LMP direction for the traditional cultural property?

3. The road provides access to areas for traditional gathering and subsistence activities.
   a. Does the road provide access to known areas of traditional gathering and subsistence activities?
   b. Does the road provide access to potential areas for traditional gathering and subsistence activities?

4. The road provides access for monitoring effects to archaeological or contemporary uses or resources.
   a. Does the road provide access to monitor effects of management activities and potential looting on archaeological sites?
   b. Does the road provide access to monitor if the needs by users are being met in traditional gathering, subsistence and spiritual activities?

Step 2 Assign the risk to Heritage Resources values associated with access transportation planning.

1. The potential risks to archaeological sites by transportation systems:
   a. Does the road and associated maintenance activities physically impact the archaeological site?
   b. Will road maintenance impact the archaeological site?
   c. Will access increase the opportunity for site looting?

2. The potential risks to traditional cultural properties/spiritual localities by transportation systems:
   a. Does the road impact the visual, audible, and solitude environmental setting for traditional cultural properties (spiritual localities)?

3. The potential risks to traditional gathering and subsistence activities from transportation systems:
   a. Does access increase competition among users for resources?
   b. Will there be any direct impacts from the road and road use on resources associated with gathering and subsistence activities?

Step 3 Give the road a yes, no, or unknown rating for one or more purposes based on the answers to the previous questions and your knowledge of the district's current and future need for Heritage Resources management.

Step 4 Enter basic information onto the spreadsheet and fill out your ratings. In the comments section, be sure to identify any specific information about the road that others may need to know or that may be helpful in future NEPA analysis.

10. Evaluation Criteria for Roads with Tribal Trust Resources

Tribal Trust Resource: Natural resources, either on or off Indian lands, retained by or reserved by or for Indian tribes through treaties, statutes, judicial decisions and executive orders that are protected by a fiduciary obligation on the part of the United States.

Tribal Trust Right: Those rights legally accruing to a tribe by virtue of inherent sovereign authority, un-extinguished aboriginal title, treaty, statue, judicial decisions, executive orders or agreement, and which give rise to legally enforceable remedies.

Tribal Sovereign Authority: Indian tribes are governmental sovereigns with inherent powers to make and enforce laws, administer justice, and manage their natural resources. When rating a road for its Tribal Trust Resource priority in the RAP planning effort for the Forest, the following steps need to be considered in developing your assessment:

Step 1 Determine the primary purpose of the road:

1. The road provides access to a Tribal trust property or resource.
2. Road provides access for monitoring effects to Tribal trust properties and resources.

Step 2 Answer the questions concerning the primary purpose of the road to help you determine its importance to Tribal trust properties. This needs to be done in consultation with the Federally Recognized Tribe that has the federally reserved trust resources and trust rights. Some roads may provide multiple purposes. You will need to consider the questions for each purpose in that case.

1. The road provides access to a Tribal trust property or resource.
   a. Does the road provide access to a Tribal trust property or resource on a Reservation or other lands held in trust?
   b. Do we have mutual agreements for managing the road with a Tribe?
   c. Is the road adjacent to or pass through Reservation lands or other lands held in trust?
2. Road provides access for monitoring effects to Tribal trust properties and resources.
3. Does the road provide access to monitor effects of management activities to Tribal trust properties and resources on and off Reservation lands or other lands held in trust?

Step 3 Assign the risk to Tribal trust property values associated with access transportation planning.

1. The risks to Tribal trust properties and resources by transportation systems:
   a. Does road impact a Tribal trust property or resource?
   b. Does road have the potential to impact a Tribal trust property or resource?

Step 4 Give the road a yes, no, or unknown rating for one or more purposes based on the answers to the previous questions and your knowledge of the current and future need for Tribal trust property management. This will need to be done in consultation with the Tribe holding the Federally Reserved Trust Resource.

Step 5 Enter basic information onto the spreadsheet and fill out with your ratings. In Comments section, be sure to identify any specific information about the road that others may need to know or that may be helpful in future NEPA analysis.

Chapter VI. Step 5: Recommendations, Opportunities, and Priorities

This analysis provides recommendations to reduce risk for aquatic resources including improvement of drainage structures or increased maintenance activities. Protection measures for Port Orford cedar are already in place. Impacts to fish, wildlife and botany species and habitat will be evaluated at the watershed or site-specific project level, and may include project modifications and/ or limited operating periods.

Watershed restoration will be an integral part of a program to aid recovery of fish habitat, riparian habitat, and water quality. The most important components of a watershed restoration program are control of road-related runoff and prevention/reduction of sediment production, restoration of the condition of riparian vegetation, and restoration of in-stream habitat complexity.

Road treatments can range from full decommissioning (closing and stabilizing a road to eliminate potential for storm damage and the need for maintenance), to road upgrading, which leaves the road open, to reconstructions when use levels require public safety related improvements. Upgrading or stormproofing is the improvement of a road drainage system to withstand large storm events without appreciable on-site or off-site damage, as well as reduce annual maintenance needs. The most common methods for upgrading include increasing culvert size to accommodate larger flows, modification of inlet geometry to pass organic debris more efficiently, and correcting stream-crossing diversion potential.

The decision to apply a given treatment depends on the value and sensitivity of downstream uses; transportation needs, social expectations, assessment of probable outcomes for success at correcting problems, costs, and other factors. Forest Service Maintenance Level 3, 4, and 5 roads are major routes that provide access to large land areas across the Forest and to significant recreational destinations such as campgrounds, picnic sites, and trailheads. Benefits, problems, and risks associated with these key routes have been identified, and recommendations made relative to the investments needed to properly manage these elements of the transportation system. Recommendations for these key routes are limited to changes in maintenance level or the identification of maintenance needs. Because these key routes serve important access needs, decommissioning was not considered as an option.

Downgrading OML for low-use roads will reduce maintenance costs. Reduction in maintenance activities will predominantly affect the smoothness of the driving surface (i.e. the surface type on an OML3 might be native while OML 4 or 5 is generally rock or asphalt) but all drainage structures will still be maintained as needed to minimize resource damage. If the OML is currently a 3, 4, or 5 and is recommended to be downgraded to an OML 2, then the road will be maintained for high clearance vehicle use instead of passenger car use.

Upgrading OML or adding existing unclassified roads to the system is appropriate in areas that are currently receiving high use, such as river access roads. Adding/upgrading these roads allows the Forest to manage and control the current use to reduce resource risk. Adding them to the system will not change this current use, but will ensure they receive adequate maintenance.

The following tables provide information on each OML 3, 4, and 5 road on the Forest. The tables include information on the administrative need, the potential resource risk, maintenance needs and recommendations to reduce impacts on aquatic resources. Priorities for each District can be found in Appendix H.

The Forest Service will coordinate any maintenance or resource issues with State and County agencies for those roads within the Forest boundary but other agency jurisdiction, as well as Right-of-Way partners and special use permit holders.

These road management recommendations will be used as a basis for proposed actions and disclosed in future appropriate NEPA documents, and will be completed as funding allows. All recommendations are in compliance with the Six Rivers LRMP and will not require a plan amendment or revision.

Table 11 SMITH RIVER NRA (& Gasquet Ranger District) roads assessment

Road #	Length	Current OML	Proposed OML	Administrative Need	Resource Risk	Aquatic Risk	Comments, Maintenance Needs & Recommendations
13N35	6.48	3	3	High (fire, timber)	High (POC) Moderate (botany)	Low	Comments: Matrix; seasonal closure for POC protection; Maintenance: Needs routine mtce
13N36	0.3	3	3	High (fire, cultural)	High (POC) Moderate (botany)	Low	Comments: Red Mountain Lookout: cultural use: seasonal closure for POC protection; Maintenance: Needs routine mtce
14N01	6.47	3	3	High (all disciplines)	Moderate (POC, botany, wildlife)	Low	Comments: Cultural use; access to Matrix; access to long-term wildlife monitoring area; Maintenance: Needs routine mtce
14N82	4	3	2	Low	High (wildlife)	Low	Comments: Need to maintain fire access; last mi blocked brush; gated; Maintenance: Needs routine mtce; Recommendation: Change to OML2
15N34	2	3	3	High (fire, recreation, wildlife)	High (POC, wildlife) Moderate (botany)	Low	Comments: Access to Gunbarrel Trail (Wilderness); LSR; Maintenance: Needs brushing and debris removal
15N36	1.1	3	3	High (all disciplines)	High (POC) Moderate (botany)	Low	Comments: Muslatt Lake access, dispersed recreation; LSR; eroding lake edge from vehicle traffic; Access to water source for fire fighting needs improvement; Maintenance: Slump in road near lake; needs resurfacing; Recommendations: Assess road for improved interface with lake and access to water source for fire
15N39	2.1	3	3	High (fire, recreation)	High (POC)	Low	Comments: South Kelsey trailhead; access to wilderness; cultural use; Maintenance: Potholes and ruts need to be fixed
15N59	0.44	3	3	High (recreation)	Low	Low	Comments: Access to Big Flat campground; road in poor condition; Maintenance: Needs resurfacing

Road #	Length	Current OML	Proposed OML	Administrative Need	Resource Risk	Aquatic Risk	Comments, Maintenance Needs & Recommendations
16N02	22.9	3	3	High (all disciplines)	High (POC, botany) Moderate wildlife	Low	Comments: Cultural use; LSR; main access to wilderness trailheads; gated (2) for POC protection (seasonal closure); Maintenance: Ruts and gullies in some areas; Doe Flat road needs additional road surfacing Recommendation: Unsafe intersection with 16N02A needs realignment (scheduled for repair in 2002)
16N03	21.3	3	3	High (all disciplines)	High (POC, wildlife) Moderate (botany)	Low	Comments: Cultural use; Matrix/LSR; gated for POC protection (seasonal closure); Maintenance: Needs reshaping; Recommendation: Addition of culverts/ crossdrains approx 1/2 mi from junction with 16N02, need to redesign for outsloping and install rock surface.
16N18	9	3	3	High (all disciplines)	High (POC) Moderate (wildlife, botany)	Low	Comment: Risk to POC entire length; LSR; gated for POC protection (seasonal closure); Maintenance: Lower section needs brushing; culverts needs to be cleaned
16N19	8.23	3	3	High (all disciplines)	High (POC, wildlife) Moderate (botany)	Low	Comments: Matrix; Maintenance: Needs routine mtce
16N21	3.6	3	3	High (fire, wildlife)	High (wildlife, POC)	Low	Comments: LSR; Maintenance: Needs routine mtce
17N04	7.82	3	3	High (all disciplines)	Low	Low	Comment: Access private land; Matrix: Maintenance: Last 2 mi before French Hill Rd are very rough and rocky, needs resurfacing
17N07	13.7	3	3	High (all disciplines)	High (POC, wild) Mod (botany)	Low	Comments: Cultural area; Matrix/LSR; access to private land; Maintenance: Very rough and rocky, needs resurfacing

Road #	Length	Current OML	Proposed OML	Administrative Need	Resource Risk	Aquatic Risk	Comments, Maintenance Needs & Recommendations
17N08	6.9	3	3	High (all disciplines)	High (POC) Moderate (botany)	High	Comments: Access to private land; long-term fisheries monitoring area; Matrix; river access; Maintenance: Needs berms pulled back, reblading. Recommendation: Upgrade culverts, stormproofing.
17N18	7.66	3	3	High (all disciplines)	High (POC, wildlife, fish) Moderate (botany)	Moderate	Comments: Wildlife/fisheries monitoring site; Maintenance: Needs routine mtce. Recommendation: Upgrade culverts, stormproofing
17N21	3.5	3	3	High (fire, wildlife, cultural)	High (wildlife, POC) Moderate (botany)	Low	Comment: Cultural area; OHV damage to meadow areas; accesses Matrix/LSR; access to private land; Maintenance: Meadows need to be blocked off; road resurfaced Recommendation: Improve water hole access for fire
17N22	4.53	3	3	High (fire, wildlife)	High (POC) Moderate (wildlife)	Low	Comments: Cultural use; Matrix; access to private land; Maintenance: Culverts need work (cleaning or replacing)
17N27	4	3	3	High (all disciplines)	High (POC)	Low	Comments: Matrix; Cal Trans disposal site; Maintenance: Needs blading
17N49	7.58	3	3	High (all disciplines)	High (botany) Moderate (POC)	Low	Comments: Cultural area; Maintenance: Damage being done at steep areas and soft spots (scheduled for repair in 2002)
18N01	0.1	3	2	High (recreation)	High (POC, fish)	Low	Comments: High recreation use area (dispersed camping); damage along edge of road to creek bed; Maintenance: Needs routine mtce; Recommendation: Change to OML2; Asses blocking off upper portion to vehicles for safety reasons and to prevent further riparian damage as required
18N02	2.8	3	3	High (all disciplines)	Low	Low	Maintenance: Needs routine mtce

Road #	Length	Current OML	Proposed OML	Administrative Need	Resource Risk	Aquatic Risk	Comments, Maintenance Needs & Recommendations
18N07	13.8	3	3	High (all disciplines)	High (POC) Moderate (botany)	Moderate	Comments: Risk to POC (MP 9 to end); Matrix; main access to wilderness trailhead; access to long-term fisheries monitoring area; dispersed recreation; gated for POC protection (seasonal closure) Maintenance: Routine maintenance needed. Recommendation: Upgrade culverts, stormproofing.
18N08	9.7	3	3	High (fire, timber)	High (POC) Moderate (wildlife)	Moderate	Comments: Matrix; dispersed recreation; river access; Maintenance: Lots of potholes, routine mtce needed. Recommendation: Upgrade culverts, stormproofing.
Total OML3 miles	170						
14N01	6.73	4	4	High (all disciplines)	Moderate (POC, botany, wildlife)	Low	Comments: Paved; Matrix: access to long-term wildlife monitoring area; gated for POC protection (seasonal closure); Maintenance: Needs routine mtce
17N05	9.89	4	4	High (all disciplines)	High (POC) Moderate (wildlife)	Low	Comment: Hydrologic risk at bluffs area, rest low; access to Matrix/LSR/wilderness; access to long-term wildlife monitoring area; gated for POC protection (seasonal closure); Maintenance: Culvert needs maintenance or replacement 1/2 mi from HWY199; Recommendation: Section near bluffs needs the road rebuilt (scheduled for repair in 2002)
17N53	0.31	4	4	High (recreation)	High (POC)	Low	Comment: Grassy Flat campground; river access; Maintenance: Needs routine mtce
17N62	0.55	4	4	High (recreation)	High (POC)	Low	Comment: Panther Flat campground; river access; uninfected POC between campground and HWY 199; Maintenance: Needs resealing
17N62A	0.3	4	4	High (recreation)	High (POC)	Low	Comment: Panther Flat campground; Maintenance: Needs routine mtce
17N62B	0.25	4	4	High (recreation)	High (POC)	Low	Comment: Panther Flat campground; Maintenance: needs Routine mtce
17N64	0.09	4	4	High (recreation)	High (POC)	Low	Comment: Patrick Creek campground; river access; Maintenance: Needs routine mtce

Road #	Length	Current OML	Proposed OML	Administrative Need	Resource Risk	Aquatic Risk	Comments, Maintenance Needs & Recommendations
17N64B	0.08	4	4	High (recreation)	High (POC)	Low	Comment: Patrick Creek campground; Maintenance: Needs routine mtce
17N70	0.8	4	4	High (all disciplines)	High (POC)	Low	Comment: Gasquet Ranger Station; Maintenance: Needs routine mtce
Total OML4 miles	30.6						
17N64A	0.25	5	5	High (recreation)	Low	Low	Comment: Patrick Creek campground; Maintenance: Needs routine mtce
15N01	18.3	5	5	High (all disciplines)	High (POC) Moderate (botany)	Low	Comment: POC-gated; access to long-term wildlife monitoring; gated for POC protection (seasonal closure); Maintenance: Culverts need cleaning/upgrade; cracked and warped road surface; continual rock fall in road
Total OML5 miles	18.55						
Proposed Maintenance Level Changes for Unclassified Roads							
Unclassified	0.1	N/A	3	High (recreation)	Low	Low	Comments: River access; paved; Madrona Camp; high recreation use; dispersed camping; Recommendation: Add to FS system at OML 3; rehab streambank
Unclassified	0.2	N/A	3	High (recreation)	Low	Low	Comments: River access; Howard Griffin Bridge; paved; high recreation use; Recommendation: Add to FS system at OML 3
Unclassified	0.1	N/A	3	High (recreation)	Low	Low	Comments: River access; old bridge site at 18-mile Creek; high recreation use; paved; Recommendation: Add to FS system at OML 3
Unclassified	0.2	N/A	3	High (recreation)	Low	Low	Comments: River access; Grassy Flat old bridge road; high recreation use; paved; Recommendation: Add to FS system at OML 3

Table 12 LOWER TRINITY DISTRICT roads assessment

Road #	Length	Current OML	Proposed OML	Administrative Need	Resource Risk	Aquatic Risk	Comments, Maintenance Needs & Recommendations
4N13	2.9	3	3	High	Moderate (wildlife)	High	Comment: Numerous scattered unstable sections.
4N31	1.15	3	3	High	Moderate (wildlife)	Low	Comment: LSR. Chronically unstable area around 6N06 intersection. Recommendation: Rt 6 should be managed at OML3 or higher.
4N31	0.2	3	4	High	Moderate (wildlife)	Low	Comment: LSR. Chronically unstable area around 6N06 intersection. Recommendation: Road segment beyond 4N36 intersection should be upgraded to OML 4.
4N36	0.84	3	3	High	Moderate (wildlife)	Low	Maintenance: Routine road mtce.
4N36	5.76	3	3	High	Moderate (wildlife)	Low	Comment: LSR. Rough running surface through areas of tough, fractured bedrock, probably due to poorly graded native surface course on steep grades. Recommendation: Improve or replace surface.
5N01	5.59	3	3	High	Moderate (wildlife)	Low	Comment: LSR. Contains a few unstable sections in the upper few miles (both road prism & cutslope problems). Fish passage barrier at MP 0.1 (mileage from Route 6). Recommendation: Replace culvert to improve fish passage and reconstruct road prism sections (subgrade) dispersed along entire length.
5N03	2.83	3	3	High	High (wildlife)	Low	Maintenance: LSR. Routine road mtce.
6N06	18.5	3	Change to OML 2 from mp 14.6 to end of road	High	Moderate (wildlife)	Moderate	Comment: LSR. Extensive unstable sections from Madden Ck to 5N01 intersection; south of intersection with 4N36. Recommendation: Low use past mp 14.6; downgrade to OML 2 from mp 14.6
6N10	3.9	3	3	High	Moderate (wildlife)	Low	Comments: LSR. Contains at least one unstable section.

Road #	Length	Current OML	Proposed OML	Administrative Need	Resource Risk	Aquatic Risk	Comments, Maintenance Needs & Recommendations
6N12	10.61	3	3	High	High (wildlife)	Moderate	Comment: Stable road
6N14	0.6	3	3	High	Low	Low	Maintenance: Routine road mtce.
6N19	1.96	3	3	High	High (wildlife)	Low	Comment: Stable upper slope / ridgetop road
6N20	4.7	3	Change to OML 2 from Oak Knob to end of road	High	Moderate (wildlife)	Low	Comment: LSR. Contains a few unstable sections, dead-ends in LSR. Recommendation: Low use beyond Oak Knob; change to OML 2 from intersection with 5N31 (3.17 miles)
6N21	0.5	3	3	High	Moderate (wildlife)	Low	Comment: LSR. East Fork Campground access
6N53	0.5	3	3	High	Low	Low	Maintenance: Routine road mtce.
6N56	0.5	3	3	High	Low	Low	Comment: River access
6N70	0.63	3	3	High	Low	Low	Comment: River access
7N02	6.68	3	3	High	Low	Moderate	Comment: Contains a few unstable sections between MP3 and MP5
7N04	10.53	3	3	High	Moderate (wildlife)	Moderate	Comments: LSR. Cultural use. Fish passage barriers at MP 3.59 (Cedar Creek crossing) and 7.50 (Groves Prairie crossing) Recommendation: Need to upgrade culverts to improve fish passage. Improve condition of road surface material on lower section of road
7N10	3.28	3	2	Low	Moderate (wildlife)	Low	Comment: LSR; Recommendation: Low use, change to OML 2
7N26	10.09	3	3	High	Moderate (wildlife)	Low	Comment: LSR. Relatively stable road, but some moderately unstable rock slopes above road
7N30	4.14	3	3	High	Moderate (wildlife)	Low	Comment: LSR. Accesses Horse Linto Interpretive trail
7N31	9.85	3	2	High	Moderate (wildlife)	Low	Comment: LSR. Low public use, entirely within LSR. Recommendation: Change to OML 2.

Road #	Length	Current OML	Proposed OML	Administrative Need	Resource Risk	Aquatic Risk	Comments, Maintenance Needs & Recommendations
7N51	1						Comment: This road accesses Tish Tang Campground, Hoopa Valley Indian Reservation; no longer a Forest Service road and should be removed from the system
7N57	0.1	3	3	High	Low	Low	Maintenance: Routine road mtce.
7N73	0.69	3	3	High	Moderate (wildlife)	Low	Comment: LSR; Maintenance: Routine road mtce
8N01	2.3	3	3	High	Moderate (wildlife)	Low	Comment: LSR; paved road; Access to range allotment
8N03	11.11	3	2	High	Moderate (wildlife)	Low	Comment: Cultural use area. Road accesses Horse Linto Campground but is barricaded before Tish Tang trailhead. Portion coming back out of Hoopa to Tish Tang trailhead has low public use. Access to range allotment Section from MP 4.73 to 11.11 is not a Forest Service road; Recommendation: Change to OML 2
10N02	17.7	3	Change to OML 2 from Bear Hole Trailhead to end of road	High	Moderate (wildlife)	Low	Comment: LSR. Cultural use; Beyond the spur to Bear Hole trailhead is a low use road that ends at the Wilderness boundary. Fish passage barriers at MP 2.9 and 1.79 (mileage from 8N01). Recommendation: Upgrade culverts for fish passage. Low use beyond the intersection with the road to Bear Hole trailhead, change to OML 2 (1.89 miles).
Total OML3 miles	139.14						
6N01	22.52	4	4	High	High-POC Mod -wild	Low	Maintenance: LSR. Routine road mtce.
6N05	0.5	4	4	High	Low	Low	Comment: Campground road
6N08	11.97	4	4	High	High (POC) Moderate (wildlife)	Low	Comments: LSR. Contains a few unstable sections in the lower couple of miles. Access to range allotment
7N02	9.84	4	4	High	Moderate (wildlife)	Moderate	Comment: Contains a few unstable sections between MP3 and MP5 (scheduled for repairs in FY 2002)

Road #	Length	Current OML	Proposed OML	Administrative Need	Resource Risk	Aquatic Risk	Comments, Maintenance Needs & Recommendations
7N54	0.18	4	4	High	Low	Low	Maintenance: Routine road mtce.
Total OML4 miles	45						
Proposed Maintenance Level Changes for OML 2 and Unclassified Roads							
9N04	1.3	2	3	High	Low	Low	Recommendation: The portion between the Hoopa Valley Indian Reservation and 10N02 receives a lot of use and should be upgraded from OML2 to OML3.
10N02spur	0.33	Non system	2	High	Moderate (wildlife)	Low	Comment: LSR. Recommendation: Due to the level of current use, the unnamed 10N02 spur that accesses Bear Hole trailhead should be added to the system as OML2.

Table 13 MAD RIVER DISTRICT roads assessment

Road #	Length	Current OML	Proposed OML	Administrative Need	Resource Risk	Aquatic Risk	Comments, Maintenance Needs & Recommendations
01N03	8.9	3	Change to OML 2 from mp 6.4 to end of road	High (all disciplines)	High (wildlife)	Low	Comment: Two existing wildlife gates located at MP 6.4 & MP 8.9. Locked from Jan 1 to Aug 31; Access to range allotment Recommendation: Change to OML 2 at MP 6.4
01N08	5.55	3	3	High	Moderate (wildlife)	Low	Comment: Alternative access for public residence. Some scattered, minor instability. Road constructed in 1968, possible culvert upgrade needed. LSR
01N15	2.93	3	Change to OML 2 from mp 1.26 to end of road	Moderate	Moderate (wildlife)	Moderate	Comment: Bridge at the Mad River was pulled out in the 80's making this a dead end road. Year-round private residence on 1N15A (junction MP 1.26). Minor instability in first mile. LSR; Recommendation: Change to an OML 2 at MP 1.26, upgrade culverts, and stormproof.
01N30	4.92	3	3	High (all disciplines)	Moderate (wildlife)	Low	Comment: LSR. The Road from MP 0.0 to MP 1.2 becomes very icy during the winter. Road used by year-round residences. Access to range allotment Road from MP 1.2 to end was repaired FY 2001. Road was built in 1968, minor instability. Maintenance: Repair cattle guard. Lower 1.2 mile will need crack sealing in the next five years; Recommendation: Assess remaining culverts for replacement or repair.
01S06	8.96	3	3	High (all disciplines)	High	Moderate	Comment: About 1.3 miles of 1S06 were rocked in FY 1999-2001; Culvert replacement at spillway and additional culvert on road will also need upgrading soon. Road has heavy traffic during most of the year. 3 or 4 year-round residences on road. Moderate slumping and several areas of instability, moderate risk of sediment delivery. Recommendation: Culvert replacement needed at MP 1.0 (from spillway); upgrade culverts, stormproof.

Road #	Length	Current OML	Proposed OML	Administrative Need	Resource Risk	Aquatic Risk	Comments, Maintenance Needs & Recommendations
01S07	11.22	3	3	High (all disciplines)	High (Botany) Moderate (wildlife)	Low	Comment: LSR. Major arterial used to access 2S08 and the Watts Lake area. Access to range allotment Minor roadbed slumping. Road adjacent to Lassics Botanical area. Minor slumping north of Lassics. Maintenance: Needs sign repair.
01S11	10	3	3	High (all disciplines)	High (Botany) Moderate (wildlife)	Low	Comment: LSR. Secondary access to 2S08 and Watts Lake. Access to range allotment Road constructed in 1959, minor instability. Maintenance: Spot rocking needed; Recommendation: Assess culverts for future repair or replacement
02N05	1.27	3	3	High (all disciplines)	Moderate (wildlife)	Moderate	Comment: Road ties 6N01 to 2N12. Access to range allotment
02N12	4.6	3	3	High (all disciplines)	Moderate (wildlife)	Low	Comment: Access to range allotment Minor to moderate roadbed failures in the past. Repaired in FY 2000.
02N14	5.43	3	Change to OML 2 from mp 3.0 to end of road	High (all disciplines)	Moderate (wildlife)	High	Comment: Access to range allotment Road has recurring road failures and severe stability problems at MP 1.2, 2.1 & 4.3. All areas were repaired in FY 2000. From East Creek bridge at MP 3.0 to terminus (approx. 2.43 mi.) road was not constructed to OML 3 standards. Roadbed is native surface with drivable dips and waterbars on road grades over 12%. Recommendation: Change OML to level 2 beyond bridge, stormproof.
02S04	1.67	3	2	Low	High (wildlife)	Low	Comment: LSR. Forest road 2S17 is the main arterial. 2S04 dead-ends into 2S17P. Recommendation: Reduce road to an OML 2.
02S05	16.21	3	3	High	High (wildlife)	Low	Comment: Wildlife gate located at MP14.5 from 27N34. This gate has not been locked in the last couple of years. Accesses year-round private property use.

Road #	Length	Current OML	Proposed OML	Administrative Need	Resource Risk	Aquatic Risk	Comments, Maintenance Needs & Recommendations
02S08	9.2	3	Change to OML 2 from MP 6.49 to end of road	High (all disciplines)	Low	Low	Comment: Access to range allotment Road is chip sealed to MP 8.4 with one recurring problem at MP 6.49 (above Dobbyn slide), also some minor slumping NW of 1S07 intersection. Road from MP 6.49 to end at MP 11.0 was built and is maintained at an OML 2. This portion has some slumping and is brushed in from 2S08B to terminus. Maintenance: needs brushing; Recommendation: Change road to an OML 2 from intersection with 1S07 to terminus.
02S12	3.6	3	3	High	Low	Moderate	Maintenance: Needs surface replacement (crushed aggregate). Recommendations: Upgrade culverts, stormproof.
02S17	8.8	3	3	High	High (wildlife)	Low	Access to range allotment Maintenance: Road is scheduled to be brushed in 2002.
02S78	0.5	3	3	High	Moderate (wildlife)	Low	Comment: LSR. Access road to Watts lake dispersed camping area.
03S12	3.7	3	3	High	Low	Moderate	Comment: Substantial roadbed failure in 1998 with major sediment delivery; repaired in 2001; future potential erosion uncertain. Recommendation: upgrade culverts, stormproof.
03S13	2	3	3	High	Low	Low	Comment: Access to range allotment Road in good shape, Steep road grades.
03S15	5.6	3	3	High	Moderate (wildlife)	Low	Comment: LSR. Anticipated future increase in winter use due to larger private land holdings being subdivided. Access to range allotment Roadbed is in good shape but has lost most of its cushion rock surface. Maintenance: Need 6-inch lift of 3-inch minus-sized gravel.

Road #	Length	Current OML	Proposed OML	Administrative Need	Resource Risk	Aquatic Risk	Comments, Maintenance Needs & Recommendations
04S15	2.57	3	3	Moderate	Low	Moderate	Comment: First 2 miles of road from County Road 503 to intersection of 3S22 has moderate winter use due to private residences off 3S22. 4S15 was graded and spot rocked in 2001. Recommendation: Upgrade culverts, stormproof.
27N12	6.58	3	Change to OML 2 from junction with 2N13 to end of road	High	Low	Low	Comment: Access to range allotment 27N12 goes east toward Low Mountain and dead ends. Road 27N13 becomes the tie through road. Recommendation: Change OML at junction with 2N13 (about 2.6 mi.) to a level 2.
27N13	5.4	3	3	High	Low	Low	Comment: Access to range allotment Scattered, minor instability.
27N33	3.63	3	3	High	Low	Low	Comment: Access to range allotment Year-round private use on first mile from 27N13 junction.
27N34	5.3	3	3	High	Low	Low	Comment: Access to range allotment Year-round use for the Travis Ranch.
Total OML3 miles	138.5						
01N70	0.6	4	4	High	Low	Low	Comment: Access to range allotment Road is showing signs of wear. This is due partly from increase fire traffic and larger/heavier vehicle use. Road was paved in 1976. Mad River RD compound. Maintenance: Need major repair of asphalt and roadbed base; Recommendation: This is an administrative site that needs asphalt pavement and road base repair
01S50	0.52	4	4	High	Low	Low	Comment: Access road for Mad River Campground.
01S51	0.25	4	4	High	High (wildlife)	Low	Comment: Access road for Fir Cove Campground.

Road #	Length	Current OML	Proposed OML	Administrative Need	Resource Risk	Aquatic Risk	Comments, Maintenance Needs & Recommendations
01S52	0.43	4	4	High	High (wildlife)	Low	Comment: Access road for Bailey Canyon Campground.
02S74	0.1	4	4	High	Low	Low	Comment: Access road for Ruth Guard Station.
03S70	0.1	4	4	High	Low	Low	Comment: Access to range allotment Access road for Zenia Guard Station residences.
06N01	25.79	4	4	High (all disciplines)	Low	Moderate	Comment: High use, main arterial road linking State Highway 36 to State HWY 299. Access to range allotment Maintenance: Needs signing, fog stripe where appropriate, and some asphalt seal from 4N12 to Hwy 36. Recommendation: Upgrade culverts, stormproof.
27N02	16.8	4	4	High	Low	Low	Comment: Access to range allotment Several areas of minor slumping, low risk of sediment delivery from slope failure. Main access road to the Yolla Bolly Middle Eel Wilderness from the Six Rivers N.F. Maintenance: Surface repair needed on road.
29N30	6.6	4	4	High	Low	Low	Comment: Access to range allotment Wildwood - Mad River road was paved in 1974. Road is narrow with abrupt pavement transitions. Rock ravel is a problem over most of road length after a rain or freezing weather. Maintenance: Needs sign replacement; Recommendation: Assess pavement and subgrade for development of corrective surface maintenance needs.
Total OML4 miles	51.2	No OML5 roads on Mad River					

Table 14 ORLEANS DISTRICT roads assessment

Road #	Length	Current OML	Proposed OML	Administrative Need	Resource Risk	Aquatic Risk	Comments, Maintenance Needs & Recommendations
9N02	1.1	3	3	High (fire) Moderate (timber)	Low	Low	Comments: Access to Hoopa Valley Indian Reservation; Matrix Maintenance: Routine road mtce
10N01	14	3	3	High (recreation, fire, timber) Moderate (lands)	Moderate (botany)	Low	Comments: Private residences, Matrix Maintenance: Routine road mtce; needs culvert upgrades and rolling dips
10N02	9.95	3	3	High (fire, timber, lands)	Moderate (wildlife)	High	Comments: Access to Hoopa Valley Indian Reservation, private property, Matrix; Maintenance: Routine road mtce
10N03	7.5	3	3	High (fire, timber) Moderate (recreation)	Moderate (botany)	Moderate	Comments: Matrix; historic OHV route; Maintenance: Needs some culvert upgrades
10N05	10.3	3	2	High (fire, timber)	High (POC)	Low	Comments: Wet site location, unstable sites, Matrix; Maintenance: Routine road mtce, needs some culvert upgrades; Recommendation: Downgrade to OML 2
10N06	3.6	3	3	Moderate (fire, recreation)	High (wildlife, POC) Moderate (botany)	Low	Comments: Seasonal closure POC gate at MP 0.1, LSR; Maintenance: Routine road mtce
10N10	4.74	3	3	High (fire, timber, cultural) Moderate (recreation)	High (wildlife)	Low	Comments: One large cutbank and fill slope failure; gated (wildlife); Matrix; cultural use, road ties to Klamath NF, water tank fill at one stream crossing; Maintenance: Culvert and ditch clean out, rocking, grading and brushing, needs some culvert upgrades,

Road #	Length	Current OML	Proposed OML	Administrative Need	Resource Risk	Aquatic Risk	Comments, Maintenance Needs & Recommendations
10N13	7.53	3	Change to level 2 from 10N13A to end of road	High (fire, timber, cultural) Moderate (recreation)	High (wildlife)	Low	Comments: Approx 0.2 miles at end of road brushy and undriveable, large amount of water pooled (possible diversion potential); Matrix; cultural use; Maintenance: Routine mtce including ditch cleanup; needs culvert upgrades; Recommendation: Downgrade from OML 3 to 2 from 10N13A to terminus of 10N13 (1.6 miles)
10N47	4.6	3	3	High (fire/timber) Moderate (lands, recreation)	High (wildlife)	Low	Comments: Access to private parcels; Matrix; Maintenance: Routine road mtce
10N72	0.19	3	3	High (fire, lands, recreation, cultural)	High (POC)	Low	Comments: Two gates off 13N01 and another off of Hwy 96 (PG&E, Davey Tree), cultural use area, tanker fill; Maintenance: Routine road mtce
10N74	0.2	3	3	High (recreation)	High (wildlife)	Low	Comments: Scenic Overlook, Special Interest Area, day use area; Maintenance: Routine road mtce
10N75	1.07	3	2	High (recreation) Moderate (fire)	High (wildlife)	Low	Comment: High recreation use, access into closed campground; cultural use, Maintenance: Routine road mtce; Recommendation: Downgrade to OML 2 and consider decommissioning road loop within campground (0.5 mile from existing gate) after site-specific analysis
10N76	0.4	3	3	High (recreation) moderate (fire)	High (wildlife)	Low	Comments: Dispersed recreation sites; river access; Maintenance: Routine road mtce
11N45	5.63	3	3	High (fire, timber) Moderate	High (POC)	Low	Comments: Access to private; Matrix; Maintenance: Needs routine mtce

Road #	Length	Current OML	Proposed OML	Administrative Need	Resource Risk	Aquatic Risk	Comments, Maintenance Needs & Recommendations
				(lands)			
11N56	0.56	3	3	High (all disciplines)	Moderate (wildlife)	Low	Comments: LSR; cultural use; river access; tanker fill site: Recommendation: Needs rock or paving
11N61	0.3	3	3	High (fire, recreation, cultural)	Low	Low	Comments: High recreation use, Recreation gate; cultural use area; river access; Recommendation: Needs rock or paving
12N01	1.75	3	3	High (fire, cultural) Moderate (recreation, lands)	Low	Moderate	Comments: Access to private, MOU with Karuk for fish rearing facility, gate blocks access to facility at MP 1.6; Maintenance: Needs routine road mtce; needs ditch cleanup and some culvert upgrades
12N10	7.38	3	3	High (fire) Moderate (recreation)	High (wild, POC) Moderate (botany)	Low	Comments: LSR; Maintenance: Needs grading and rocking
12N12	23.4	3	3	High (all disciplines)	High (wildlife, POC) Moderate (botany)	Low	Comments: LSR/Matrix; Maintenance: Needs routine road mtce
12N13	7.23	3	3	High (fire, recreation)	High (POC) Moderate (wildlife)	Moderate	Comments: LSR; some culverts undersized and partially plugged, diversion potential; Maintenance: Needs culvert upgrades, ditch clean out, and other routine mtce
12N20	5.9	3	3	High (fire) Moderate (recreation)	High (POC) Moderate (wildlife, botany)	Moderate	Comments: LSR; Maintenance: Needs routine road mtce

Road #	Length	Current OML	Proposed OML	Administrative Need	Resource Risk	Aquatic Risk	Comments, Maintenance Needs & Recommendations
13N10	2.95	3	2	Moderate (all disciplines)	Low	Moderate	Maintenance: Needs signing, grading, brush removal and some culvert cleaning and replacement
13N18	2.06	3	3	High (all disciplines)	High (wildlife)	Low	Comments: Road paved, high public use; cultural use; Matrix; Maintenance: Needs culvert upgrades and other routine mtce
13N60	0.5	3	3	Low (all disciplines)	Low	Low	Comments: Paved, access old rock quarry; LSR; Maintenance: Routine road mtce
14N03	2.18	3	3	High (recreation, cultural) Moderate (fire)	High (POC) Moderate (wildlife, botany)	Low	Comments: Elk Valley Road, POC gate at MP 0.1 (seasonal closure), high risk of introducing POC root disease into Blue Creek, Dillon Creek; access to wilderness; LSR; cultural use, consult with Karuk, Yurok, and Tolowa Tribes; fish passage barrier at MP 1.79. Maintenance: Needs culvert upgrades, diversion dips and other routine mtce; Recommendation: Keep and maintain, pending further analysis, which will consider the options for reducing the risk of spreading POC, root disease.
Total OML3 miles	122.1						
10N12	3.46	4	4	High (recreation) Moderate (fire)	High (POC) Moderate (botany)	Low	Comments: Fish Lake Rd, paved to campground; 2 POC gates at MP 0.1 and 3.0 (seasonal closure); LSR; Maintenance: Routine road mtce
10N51	0.86	4	2	Moderate (fire, recreation)	High (POC)	Low	Comments: Fish Lake loop; 2 POC gates at start and end 0.8 miles (seasonal closure), LSR; Maintenance: Routine road mtce; Recommendation: Downgrade to OML 2
10N70	0.17	4	4	High (recreation)	Low	Low	Comments: High recreation use area; Maintenance: Routine road mtce; Recommendation: Needs paving

Road #	Length	Current OML	Proposed OML	Administrative Need	Resource Risk	Aquatic Risk	Comments, Maintenance Needs & Recommendations
11N05	12.4	4	4	High (fire, cultural, lands) Moderate (recreation)	High (POC) Moderate (botany)	Moderate	Comments: Diversion potential sites along road, culverts undersized, slide stabilizations, pavement failures; accesses private residences, LSR; cultural use, Maintenance: Need to invest in more routine mtce; Recommendation: Needs culvert upgrades
11N11	3.15	4	4	High (fire, timber, cultural) Moderate (lands)	Low	Low	Comments: Lower 1.5 miles is owned by Humboldt County; cultural use area; Matrix; Maintenance: Routine mtce in upper segment; Recommendation: Continue to work with County on lower segment; update records to reflect agreement with County
11N62	0.3	4	4	High (fire, Recreation)	Low	Low	Comments: High recreation use, 2 recreation gates; Maintenance: Routine mtce
11N70	0.5	4	4	High (all disciplines)	Low	Low	Comments: Orleans RD compound, paved; access road for District facilities; Maintenance: Routine road mtce
13N01	39.4	4	4	High (all disciplines)	High (wildlife/ POC) Moderate (botany)	Moderate	Comments: POC gates at MP 5.5 and 12.1 (seasonal closure), access to private residences, pavement and aggregate base; cultural use; Maintenance: Routine road mtce; culvert upgrade and cleanout, pull ditch line
Total OML4 miles	60.2						
15N01	29.2	5	5	High (all disciplines)	Low	Low	Comments: GO Road, paved, private land; access to wilderness; LSR/Matrix; Maintenance: Needs culvert upgrades and other routine mtce
Total OML5 miles	29.2						
Proposed Maintenance Level Changes for Level 2 and Unclassified Roads							

Road #	Length	Current OML	Proposed OML	Administrative Need	Resource Risk	Aquatic Risk	Comments, Maintenance Needs & Recommendations
10N20	0.2	2	3	High (fire, cultural, recreation) moderate (lands)	Low	High	Comments: Cultural use; tanker fill site; Recommendation: Upgrade OML 3, needs paving
10N28	0.1	2	3	High (fire, cultural, recreation)	Moderate (wildlife)	High	Comments: High recreation and admin use; cultural use; tanker fill site; river access; LSR; Recommendation: Upgrade to OML 3; needs seasonal mtce and riprap to armor right bank for treatment facility
11N54	0.2	2	3	High (fire, cultural) Moderate (recreation)	Low	Moderate	Comments: Cultural use; tanker fill site; Klamath River access; Maintenance: Routine road mtce; Recommendation: Upgrade to OML 3
11N72	0.3	2	3	High (recreation, cultural) moderate (fire)	Low	Moderate	Comments: High recreation use, dispersed recreation, Cal Trans disposal site; cultural use area, river access; Maintenance: Needs rocking; Recommendation: Upgrade to OML 3
11N76	0.2	2	3	High (recreation, cultural) moderate (fire, lands)	Low	Low	Comments: High recreation use, day-use area; cultural use, river access; Recommendation: Upgrade to OML 3

Table 15 UKONOM DISTRICT roads assessment

Road #	Length	Current OML	Proposed OML	Administrative Need	Resource Risk	Aquatic Risk	Comments, Maintenance Needs & Recommendations
11N17	0.3	3	4	High (recreation) Moderate (fire)	Low	Low	Comments: Oak Bottom campground, paved, Campground gate; Maintenance: routine road mtce; Recommendation: Upgrade to OML 4
11N18	0.18	3	3	High (fire) Moderate (lands)	Low	Low	Comments: USFS compound at Oak Bottom, paved, access to tree cooler; Maintenance: Routine road mtce
12N01	0.5	3	3	High (recreation)	Low	Low	Comments: access across Salmon River bridge to existing gate, trailhead and river access; Maintenance: routine road mtce
12N01	1.4	3	Remove from system	Low (all disciplines)	Low	High	Comments: Steinacher Road, this portion of the road is being decommissioned under a completed NEPA decision in cooperation with the Karuk Tribe and is expected to be completed in 2002-03: Recommendation: Remove from Roads Database upon completion
12N01	2.9	3	Remove from system	Low (all disciplines)	Low	High	Comments: Steinacher Road, road was decommissioned in cooperation with the Karuk Tribe during 1998-2001; Recommendation: Remove from Road Database
12N22	0.8	3	3	High (fire, cultural) Moderate (recreation)	Moderate (wildlife)	Low	Comments: Access to water source and dispersed recreation site; LSR; cultural area, Maintenance: Routine road mtce
12N34	0.4	3	3	High (recreation)	Low	High	Comments: River access, Maintenance: Potential unstable road fills, needs routine road mtce

Road #	Length	Current OML	Proposed OML	Administrative Need	Resource Risk	Aquatic Risk	Comments, Maintenance Needs & Recommendations
12N52	6	3	3	High (all disciplines)	Low	High	Comments: Main arterial; 1997 storm damage area; steep headwall area of Rogers Creek where hillside and road is crumbling away into Rogers Creek. Road width in this area getting too narrow for other than passenger cars and pickup trucks to get by; repair would be very costly and/or destabilizing, with potential future instability problems; Recommendation: Some road segments need work, high aquatic resource risk but treatable, outslope and improve drainage. Stormproof and/or upgrade
13N08	4.4	3	2	High (fire, timber, recreation)	Low	Low	Comments: Not well maintained, 2 FS gates; Matrix; Ukonom Mt Lookout; Maintenance: Stormproof and/or upgrade culverts; Recommendation: Downgrade to OML 2, remove wildlife gate at MP 0.1
13N11	12.5	3	3	High (all disciplines)	Low	High	Comments: Old and active landslides. Upper segment in decomposed granitics. Most of road OKS but many long inboard ditched (collection potentials) and stream diversion potentials. Two high risk/consequence stream crossings (large fills with small pipes); private prop access, fire access, Recommendation: Stormproof and/or upgrade culverts
13N12	4.55	3	3	High (all disciplines)	Low	Low	Comments: Old landslide - active in spots. Dissected ephemeral channels; private property access; history of elk use; future pond development site; Recommendation: Stormproof and upgrade culverts
13N12	0.9	3	3	High (all disciplines)	Moderate (wildlife)	Low	Comments: Old landslide - active in spots; Recommendation: Stormproof and upgrade culverts
13N13	14.7	3	3	High (all disciplines)	Low	High	Comments: A great deal of slide material annually; Matrix; Maintenance: Needs upgrades and routine road mtce

Road #	Length	Current OML	Proposed OML	Administrative Need	Resource Risk	Aquatic Risk	Comments, Maintenance Needs & Recommendations
13N18	1.7	3	3	High (fire, timber, recreation, cultural) Moderate (lands)	Low	High	Comments: Road paved, high public use; cultural use; Matrix; Maintenance: Needs upgrades routine road mtce
13N18	10.4	3	3	High (fire, timber, cultural) Moderate (lands, recreation)	Low	High	Comments: High public use; cultural use; Matrix; Maintenance: Needs upgrades and routine road mtce
13N30	0.2	3	3	High (recreation)	High (wildlife)	Low	Comments: River access; Maintenance: Routine road mtce
13N35	6.4	3	3	High (fire, timber, cultural) Moderate (wildlife)	Moderate (botany)	Low	Comments: Matrix; cultural use; Maintenance: Routine road mtce
14N21	0.8	3	2	High (timber)	High (wildlife)	High	Comments: Brushy, road blown out at end; Matrix; Recommendation: Downgrade to OML 2 and consider decommissioning after site specific analysis
14N21	6	3	3	High (fire, timber, cultural)	High (wildlife, POC)	Moderate	Comments: 4 FS gates (2-wildlife, 2-POC); Matrix; cultural use; Maintenance: Routine road mtce; Recommendation: Remove 2 wildlife gates
15N17	13.1	3	3	High (all disciplines)	Moderate (botany)	High	Comments: Major recreational access route; 1997 storm damage site; slumps, decomposed granitics, bank and fill slough; road is generally stable however many diversion potentials and stream crossings/cross-drains with excessively long contributing inboard ditches; one very large fill with inadequate, plugged culvert needs immediate attention. 1 FS gate (wildlife) Recommendation: Clean plugged culverts immediately; maintain with improvements for

Road #	Length	Current OML	Proposed OML	Administrative Need	Resource Risk	Aquatic Risk	Comments, Maintenance Needs & Recommendations
							drivability, outslope sections, stormproof and/or upgrade culverts; remove wildlife gate
15N17	0.5	3	3	High (all disciplines)	Moderate (botany)	High	Comments: Many diversion potentials and very long inboard ditches; decomposed granitics; bank and fill sloughs; Recommendation: Maintain with improvements for drivability, stormproof and/or upgrade culverts
Total OML3 miles	89						
11N19	0.52	4	4	High (fire)	Low	Low	Comments: USFS compound at Oak Bottom (housing and facilities), paved; Maintenance: Routine road mtce.
12N11	0.15	4	4	High (fire, cultural, lands)	Low	Low	Comments: Ukonom admin site and housing, Somes Bar Work center, paved, FS gate, unstable land, under MOU with Karuk Tribe; cultural area; Maintenance: Routine road mtce
13N11	3.9	4	4	High (all disciplines)	Moderate (botany)	High	Comments: 1997 storm damage site (Kennedy Creek diversion), fill failures. Old and active landslides (Ti Bar slide), 2 FS gates at beginning and ending of road 3.9 miles; private prop access; fire access; Recommendation: Remove both wildlife gates, upgrade/stormproof culverts as needed
13N13	0.45	4	4	High (fire, cultural, timber)	Low	Low	Comments: Paved for safety purposes; cultural use; Matrix; Maintenance: Routine road mtce

Road #	Length	Current OML	Proposed OML	Administrative Need	Resource Risk	Aquatic Risk	Comments, Maintenance Needs & Recommendations
13N29	0.15	4	4	High (cultural, recreation)	Low	Low	Comments: Ti Bar Flat River Access, cultural use; Maintenance: Routine road mtce
14N01	10.2	4	4	High (all disciplines)	Low	High	Comments: Major recreational access route; shear zone; storm damaged in 1972 and 1997; road generally good shape between crossings although pavement slumping in areas; three active landslides on road - one threatens entire road prism; many diversion potentials; several very long inboard ditches; three large fills with undersize culverts; two rusted undersized culverts; ponding behind three culverts. Recommendation: Maintain with improvements for drivability, outslope sections; stormproof and/or upgrade culverts
14N51	0.3	4	4	High (recreation)	Low	Low	Comments: Paved; recreation gate; recreation camp site and facilities Maintenance: Routine road mtce
14N69	1.9	4	4	High (fire, timber, cultural)	Low	Low	Comments: Paved, 2 FS gates for safety; Matrix; cultural use; Maintenance: Routine road mtce
15N17	6.9	4	4	High (all disciplines)	Moderate (botany)	Low	Comments: Major recreational access route; 1997 storm damage site (fill slumping, road subsides); winter bank slough; paved. Recommendation: Stormproof and/or upgrade culverts
Total OML4 miles	24	No OML 5 roads on Ukonom					
Proposed Maintenance Level Changes for Level 2 and Unclassified Roads							
Unclassified	0.3	NA	3	High (fire, recreation)	Low	Low	Comments: Day use area; tanker fill site; river access; Recommendation: Entire road needs improvements, add to FS Roads Database, assign road number and OML 3

Road #	Length	Current OML	Proposed OML	Administrative Need	Resource Risk	Aquatic Risk	Comments, Maintenance Needs & Recommendations
Unclassified	0.1	NA	3	High (fire, cultural, recreation)	Low	Low	Comments: River access, day use area; tanker fill site, river access; Maintenance: Routine road mtce; Recommendation: Add to FS Roads Database, loop road, assign road number and OML 3
Unclassified	0.3	NA	3	High (fire, recreation)	Low	Low	Comments: Day use area; tanker fill site; river access; Maintenance: Routine road mtce; Recommendation: Entire road needs improvements, add to FS Roads Database, assign road number and OML 3
Unclassified	0.3	NA	3	High (fire, cultural, recreational)	Low	Low	Comments: River access; tanker fill site; river access; Maintenance: Routine road mtce; Recommendation: Entire road needs improvements, add to FS Roads Database, developed road to river, assign road number and OML 3
12N44	0.8	1	3	High (fire, recreation)	Low	Moderate	Comments: River access; Maintenance: Routine road mtce; Recommendation: Upgrade to OML 3

APPENDIX A: Routine Maintenance Activities

Specific Activities

The proposed Forest-wide Routine Road Maintenance Program comprises of the following activities. Many activities incorporate mitigation guidelines and BMPS as standard practice. Each activity description references pertinent BMPs that are described above. The numbers in parentheses (e.g. 811) at the end of each activity description refer to the R5 Forest Service Specifications for Maintenance of Roads (USDA, 1992), which guides the development and administration of FS road maintenance contracts. All of the items listed below do not necessarily occur each year, but are implemented under the established routine road maintenance contract as conditions warrant at locations throughout the Forest.

1. Blading - This work consists of surface blading native or aggregate roadbeds to a condition to facilitate traffic and provide proper drainage. Blading includes shaping the crown or slope of the traveled way, berms, and drainage dips. Excess roadbed width shall be shaped only as needed to provide drainage away from the traveled way. The work would be generally be accomplished by a motor grader. BMPs 2-4, 2-7, 2-11, 2-19, 2-22, and 2-23 will be implemented with this action. (811)

2. Dust abatement - This work consists of applying dust palliatives to native and aggregate-surfaced roads. It includes standard material specifications for applying non-petroleum products; however, petroleum products can be added. Care will be taken to limit petroleum-based products to the travel way, especially at channel crossings. The authorized work is not intended to provide a bituminous running surface. Bitumen is the asphaltic residue in the distillation of coal tar, wood tar, petroleum, etc. This work would generally be accomplished with a water truck. To prevent impacts to riparian resources, water will be drawn from designated drafting sites with a screened intake. BMP 2-21 will be applied with this activity.

3. Spot surfacing - This work consists of placing surface aggregate as designated. It includes preparing the area, and furnishing, hauling, and placing all necessary materials to blend with the adjacent road cross-section. This work would generally be accomplished with a dump truck, motor grader, and a small roller. BMPs 2-22 and 2-23 will be applied during spot surfacing. (813)

4. Asphalt pavement patching - This work consists of patching potholes, skin patching of asphalt surfaces, and patching asphalt berms. Generally, this work will be accomplished using a grader, dump truck, small paver, and small roller. A backhoe will be used if the damaged area requires digging out. BMPs 2-22 and 2-23 will be implemented with this activity. (814)

5. Paved surface cleaning - This work consists of removing loose material from a paved traveled way, including bridge decks and paved shoulders. Use of hydraulic flushing will not be permitted within a horizontal distance of 200 feet of a live stream, unless approved by the government. Other cleaning should be accomplished using power broom or blowers, truck with rock blade, and grader. BMPs 2-11, 2-19, 2-21, 2-22, and 2-23 will be implemented during this activity. (815)

6. Surface treatment - This work consists of treating the surface of asphalt concrete or chip seal-surfaced roads with a seal coat, a chip seal, or an asphalt concrete overlay. The purpose of this work is to rejuvenate the road surface, seal hairline cracks, or to replace a worn surface that has become unsafe. Equipment that may be used include power brooms, dump trucks, paving machines, chip spreaders, and oil distributor trucks. Surface treatment work is performed at the rate of 4 to 8 MPH. BMPs 2-11, 2-19, 2-21, 2-22, and 2-23 will be implemented during this activity.

7. Maintenance of unpaved shoulders - This work consists of reshaping unpaved shoulders adjacent to a paved traveled way to their original configuration. This work would generally be accomplished with a motor grader with attachments. There will be no sidecasting anywhere that there is likelihood that the sidecast material will reach a channel. BMPs 2-7, 2-11, and 2-19 will be applied as part of this activity. (816)

8. Asphalt crack cleaning and repairing - This work consists of cleaning and filling cracks in existing asphaltic concrete (AC) surfaces that are 1/4 inch or wider. Cleaning is usually accomplished with compressed air, and the AC is applied using a propane-heated double-boiler unit with a wand attachment. BMPs 2-22 and 2-23 will be implemented with this action. (818)

9. Ditch maintenance - This work consists of removing rock, wood, soil, and other materials and re-shaping all types of drainage ditches to provide a waterway which is unobstructed. During the operation, care shall be taken to retain existing low growing vegetative cover in the ditches. This work would generally be accomplished with a motor grader and/or backhoe. BMPs 2-2, 2-4, 2-6, 2-7, 2-19, and 2-22 apply to this action. (831)

10. Remove and end haul materials - This work consists of loading, hauling, and placing slide debris or excess materials (such as rock, soil, and vegetation) to designated disposal sites. This work would normally be accomplished with a wheel loader and dump truck when excess materials are hauled to a disposal site. If materials are used to fill slumps in the road compaction will be required. Generally a wheel loader, dump truck, compacter, motor grader, and backhoe would be used. BMPs 2-3, 2-7, 2-11, 2-19, and 2-22 will be applied with this activity. (832)

11. Culvert replacement - This work includes removal of existing culverts, bed preparation, installation and backfill of new culverts of the size and length specified as part of routine road maintenance. Excavation shall be at least as wide as three pipe diameters. The culvert shall be installed to maintain auniform flow line from inlet to outlet channel. Culverts up to 48-inch diameter may be replaced. Culverts with cover exceeding 4 feet or at locations requiring dewatering shall not replaced under the maintenance contract and will require a separate BA/BE. Work would generally be accomplished with a backhoe, tractor, and compactor. BMPs 2-2, 2-3, 2-10, 2-14, 2-17 and 2-22 will apply to this activity. (833)

12. Drainage structure maintenance - This work consists of cleaning and reconditioning culverts and other drainage structures such as catch basins, inlet and outlet channels, and ditch line transition areas. This is usually accomplished by hand, or in extreme cases, with a backhoe. Work does not include cleaning totally plugged culverts or replacing all or part of the drainage structure (See #11. Culvert Replacement). Hydraulic flushing of drainage structures is not a standard practice of this activity, and will only be designated by FS when all potential impacts are addressed and minimized. BMPs 2-7, 2-11, 2-19, and 2-22 are a part of this activity and will be implemented. (834)

13. Roadway drainage maintenance - This work consists of providing drainage on roads that have been physically closed to traffic. At completion of drainage, work the road will not necessarily be passable to vehicles. BMPs 2-2, 2-4, 2-6, 2-7, 2-11, 2-19, and 2-22 will be applied with this activity. (835)

14. Drainage dip maintenance - This work consists of maintenance of existing drainage dips, including rolling dips on native, aggregate, and paved roads, and maintenance of special outlet structures to provide for a smooth flow of water from the traveled way. Generally, this work would be accomplished with a motor grader with attachments. BMPs 2-2, 2-4, 2-7, 2-11, 2-19, and 2-22 will be implemented with drainage dip maintenance. (837)

15. Vegetation establishment - This work consists of applying seed, fertilizer, and mulch, and planting roadways and disposal areas that have been disturbed by maintenance activities. This work would usually be accomplished by hand. BMPs 2-2, 2-4, and 2-22 will be implemented.

16. Cutting roadway vegetation (brushing)- This work consists of cutting all vegetation, including trees, less than 6" in diameter at six inches above the ground in order to improve sight distance and provide overhead clearance. This work would be performed by hand using chainsaws or with a mechanical brush cutter. The objective is to manage roadside vegetation over time to maintain slope stability through vegetation cover while providing for sight distance and drainage needs. All of the work would occur within the road prism. BMPs 2-3, 2-4, 2-5, 2-11, 2-19 and 2-22 will be applied with this action.

17. Logging out - This work consists of ordered removal of fallen trees and snags that encroach into the roadway and within 4 feet of the roadbed (right-of-way for berm and road maintenance practices). This work is intended to open roads closed by minor windstorm debris or other natural occurrences, and pertains to unmerchantable material. Some chainsaw and mechanical work may be necessary. Logging out that occurs on Level 2 roads to gain access will meet the short duration criteria specified above at the beginning of the project list. BMPs 2-3, 2-19, and 2-22 will be applied with logging out actions.

18. Hazard removal and cleanup - This work consists of removing and disposing of marked hazards such as trees, rocks, stumps and fallen trees that will create traffic safety problems. Woody debris and slash in excess of 1 foot in length or 3 inches in diameter shall not remain in ditches. All work will be within the road prism. Removal of standing roadside hazard trees is addressed in the Forest-wide Hazard Tree Removal Biological Assessment/Evaluation (March 5, 1997), and such projects may be tiered to that document. BMPs 2-3, 2-7,2-11, 2-19, and 2-22 will be implemented with this activity. (854)

19. Maintenance of cattle guards - This work consists of cleaning and restoring cattle guards and appurtenances. Work would normally be accomplished by hand, although a backhoe may be used to raise the deck grid. BMPs 2-2, 2-3, and 2-22 will be implemented. (861)

20. Sign maintenance - This work consists of cleaning, replacing, and reconditioning signs, posts, and markers. Forest Service personnel would normally accomplish this work by hand. BMPs 2-3 and 2-22 will apply here.

APPENDIX B: Best Management Practices Specific to Road Maintenance

2-4 Stabilization of Road Slopes and Spoil Disposal Areas

Objective: To prevent unacceptable erosion from exposed cut slopes, fill slopes, and spoil disposal areas.

2-5 Road Slope Stabilization

Objective: To reduce sedimentation by minimizing erosion from road slopes, and minimizing the chance for slope failure along roads.

2-6 Dispersion of Subsurface Drainage from Cut and Fill Slopes

Objective: To minimize the possibilities of cut or fill slope failure and subsequent production of sediment.

2-7 Control of Road Drainage

Objective: To minimize the erosive effects of water concentrated by road drainage features. To disperse runoff from disturbances within the road clearing limits; to lessen the sediment load from roaded areas; and to minimize erosion of the road prism by runoff from road surfaces and from uphill areas.

2-11 Control of Sidecast Material

Objective: To minimize sediment production originating from sidecast material during construction or maintenance.

2-12 Servicing and Refueling of Equipment

Objective: To prevent pollutants such as fuels, lubricants, bitumens, sewage, wash water, and other harmful materials from being discharged into, or near rivers, streams and impoundments, or into natural or man-made channels.

2-17 Bridge and Culvert Installation

Objective: To minimize sedimentation and turbidity resulting from excavation for in-channel structures.

2-18 Regulation of Streamside Gravel Borrow Areas

Objective: To limit channel disturbances and sediment production associated with gravel source development.

2-19 Disposal of Right-of-Way and Roadside Debris

Objective: To ensure that debris generated during road construction and maintenance is kept out of streams and to prevent slash and other debris from subsequently obstructing channels. To ensure debris dams are not formed which obstruct fish passage, or could result in downstream damage from high water flow surges after dam failure.

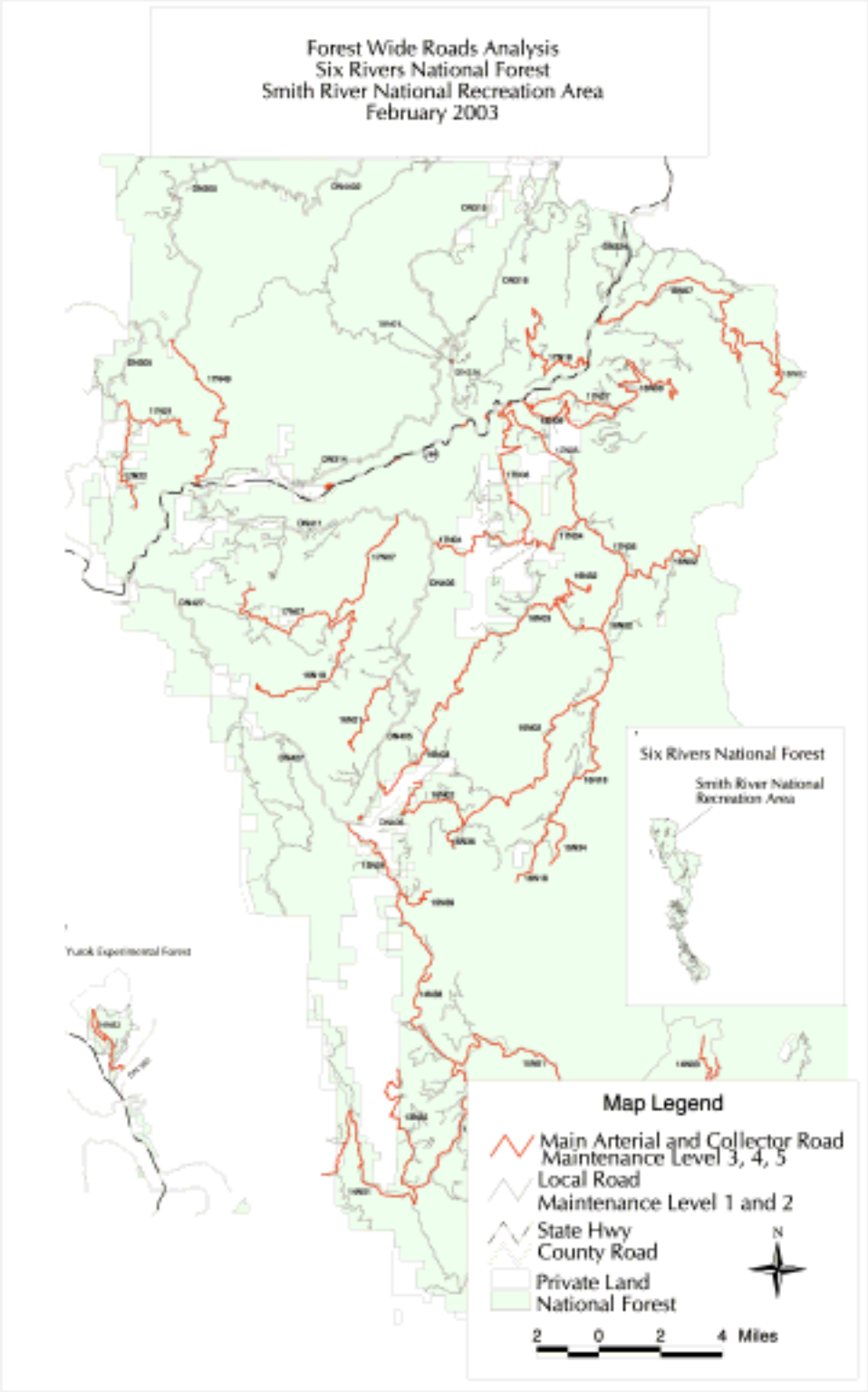
2-22 Maintenance of Roads

Objective: To maintain roads in a manner that provides for water quality protection by minimizing rutting, failures, sidecasting, and blockage of drainage facilities (all of which can cause sedimentation and erosion).

2-23 Road Surface Treatment to Prevent Loss of Materials

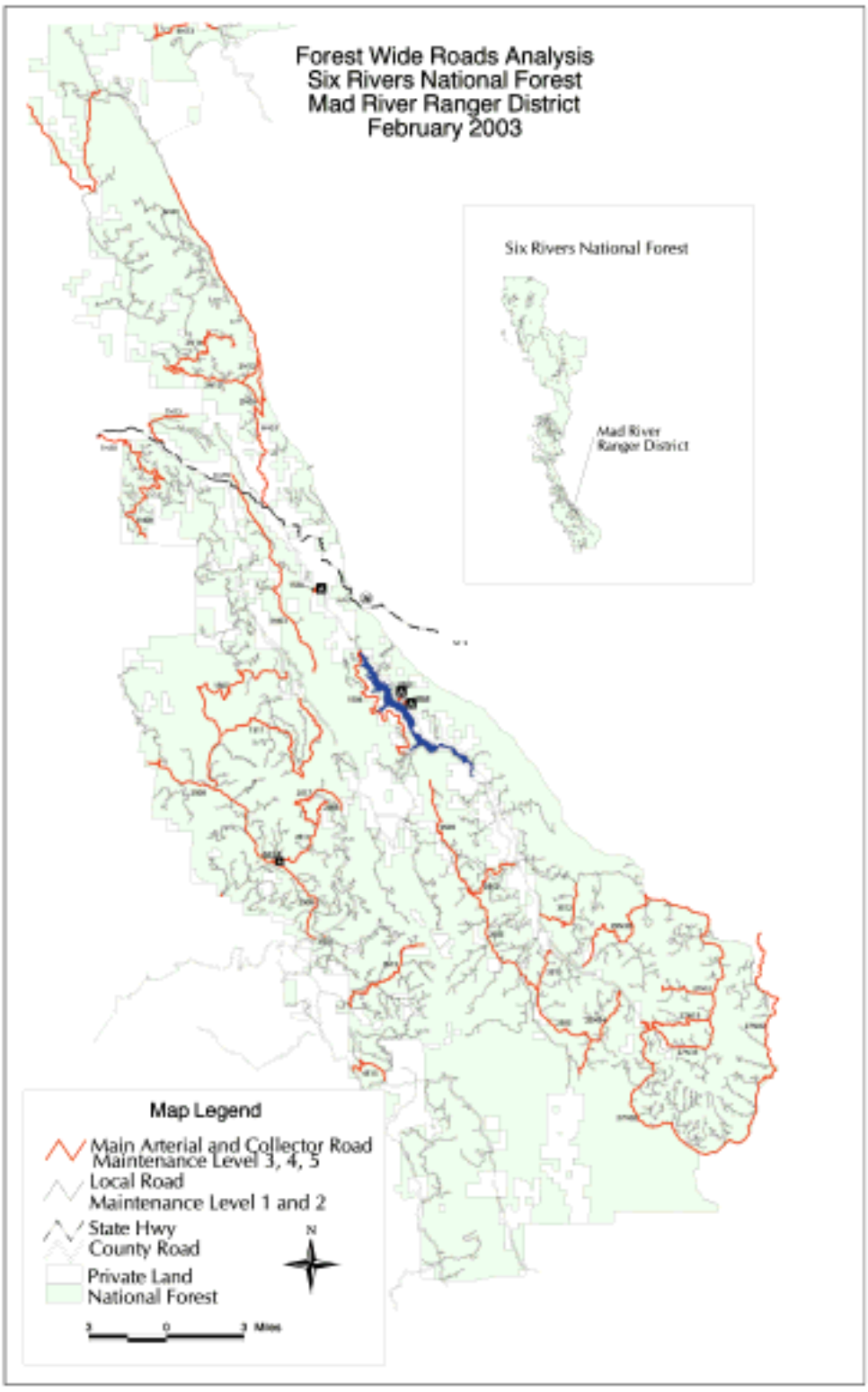
Objective: To minimize the erosion of road surface materials and consequently reduce the likelihood of sediment production from those areas.

APPENDIX C: Maps of Operational Maintenance Level 3, 4, and 5 Roads by District


Forest Wide Roads Analysis
Six Rivers National Forest
Smith River National Recreation Area
February 2003
Six Rivers National Forest
Smith River National Recreation Area
Map Legend
Main Arterial and Collector Road Maintenance Level 3, 4, 5
Local Road Maintenance Level 1 and 2
State Hwy
County Road
Private Land
National Forest
N
2 0 2 4 Miles


Forest Wide Roads Analysis
Six Rivers National Forest
Orleans and Ukonom Ranger Districts
February 2003
Ranger Station
Six Rivers National Forest
Orleans and Ukonom Ranger Districts
Map Legend
Main Arterial and Collector Road
Maintenance Level 3, 4, 5
Local Road
Maintenance Level 1 and 2
State Hwy
County Road
Private Land
National Forest
N
2 0 2 4 Miles


Forest Wide Roads Analysis
Six Rivers National Forest
Lower Trinity Ranger District
February 2003
Six Rivers National Forest
Lower Trinity Ranger District
Map Legend
Main Arterial and Collector Road
Maintenance Level 3, 4, 5
Local Road
Maintenance Level 1 and 2
State Hwy
County Road
Private Land
National Forest
N
3 0 3 Miles


Forest Wide Roads Analysis
Six Rivers National Forest
Mad River Ranger District
February 2003
Six Rivers National Forest
Mad River
Ranger District
Map Legend
Main Arterial and Collector Road
Maintenance Level 3, 4, 5
Local Road
Maintenance Level 1 and 2
State Hwy
County Road
Private Land
National Forest
N
3 0 3 Miles

APPENDIX D: Seventy-one Questions Relating to Roads Analysis

The document Roads Analysis: Informing Decisions about Managing the National Forest Transportation System (USDA Forest Service 1999) developed 71 questions that might be used for roads analysis for both the existing or potential road system. Not all the questions are relevant at all levels of roads analysis and many are only appropriate at a regional, forest, or watershed level. The questions were designed to assist analysis teams in developing criteria and approaches appropriate to the analysis area. The guideline document also provides direction and suggestions about the best scale at which each question could be answered. Below is the full list of questions and the scale at which they should be answered.

Table D 1 Seventy-one Questions Relating to Roads Analysis

NO.	QUESTION AND ISSUE AREA	LEVEL FOR QUESTION CONSIDERATION
Ecosystem Functions and Processes (EF)		
EF(1)	What ecological attributes, particularly those unique to the region, would be affected by roading of currently unroaded areas?	Watershed
EF(2)	To what degree do the presence, type, and location of roads increase the introduction and spread of exotic plant and animal species, insects, diseases, and parasites? What are the potential effects of such introductions to plant and animal species and ecosystem function in the area?	Watershed
EF(3)	To what degree does the presence, type, and location of roads contribute to the control of insects, diseases, and parasites?	Forest and Watershed
EF(4)	How does the road system affect ecological disturbance regimes in the area?	Watershed
EF(5)	What are the adverse effects of noise caused by developing, using, and maintaining roads?	Forest and Watershed
Aquatic, Riparian Zone, and Water Quality (AQ)		
AQ(1)	How and where does the road system modify the surface and subsurface hydrology of the area?	Watershed
AQ(2)	How and where does the road system generate surface erosion?	Forest and Watershed
AQ(3)	How and where does the road system affect mass wasting?	Watershed
AQ(4)	How and where do road-stream crossings influence local stream channels and water quality?	Watershed

NO.	QUESTION AND ISSUE AREA	LEVEL FOR QUESTION CONSIDERATION
AQ(5)	How and where does the road system create potential for pollutants, such as chemical spills, oils, de-icing salts, or herbicides, to enter surface waters?	Forest after Watershed level data is collected
AQ(6)	How and where is the road system "hydrologically connected" to the stream system? How do the connections affect water quality and quantity (such as, the delivery of sediments and chemicals, thermal increases, elevated peak flows)?	Watershed
AQ(7)	What downstream beneficial uses of water exist in the area? What changes in uses and demand are expected over time? How are they affected or put at risk by road derived pollutants?	Watershed
AQ(8)	How and where does the road system affect wetlands?	Watershed
AQ(9)	How does the road system alter physical channel dynamics, including isolation of floodplains; constraints on channel migration; and the movement of large wood, fine organic matter, and sediment?	Watershed
AQ(10)	How and where does the road system restrict the migration and movement of aquatic organisms? What aquatic species are affected and to what extent?	Watershed and Project
AQ(11)	How does the road system affect shading, litter fall, and riparian plant communities?	Watershed
AQ(12)	How and where does the road system contribute to fishing, poaching, or direct habitat loss for at-risk aquatic species?	Watershed
AQ(13)	How and where does the road system facilitate the introduction of non-native aquatic species?	Watershed
AQ(14)	To what extent does the road system overlap with areas of exceptionally high aquatic diversity or productivity, or areas containing rare or unique aquatic species or species of interest?	Watershed
Terrestrial Wildlife (TW)		
TW(1)	What are the direct effects of the road system on terrestrial species habitat?	Forest and Watershed
TW(2)	How does the road system facilitate human activities that affect habitat?	Watershed
TW(3)	How does the road system affect legal and illegal human activities (including trapping, hunting, poaching, harassment, road kill, or illegal kill levels)? What are the effects on wildlife species?	Watershed
TW(4)	How does the road system directly affect unique communities or special features in the area?	Watershed
Economics (EC)		

NO.	QUESTION AND ISSUE AREA	LEVEL FOR QUESTION CONSIDERATION
EC(1)	How does the road system affect the agency's direct costs and revenues? What, if any, changes in the road system will increase net revenue to the agency by reducing cost, increasing revenue, or both?	Forest and Watershed
EC(2)	How does the road system affect the priced and non-priced consequences included in economic efficiency analysis used to assess net benefits to society?	Forest and Watershed
EC(3)	How does the road system affect the distribution of benefits and costs among affected people?	Forest and Watershed
Commodity Production		
Timber Management (TM)		
TM(1)	How does road spacing and location affect logging system feasibility?	Watershed
TM(2)	How does the road system affect managing the suitable timber base and other lands?	Forest for OML3-5 Watershed for 1,2 and Unclassifieds
TM(3)	How does the road system affect access to timber stands needing silvicultural treatment?	Forest for OML3-5 Watershed for 1,2 and Unclassifieds
Minerals Management (MM)		
MM(1)	How does the road system affect access to locatable, leasable, and salable minerals?	Forest for OML3-5 Watershed for 1,2 and Unclassifieds
Range Management (RM)		
RM(1)	How does the road system affect access to range allotments?	Forest for OML3-5 Watershed for 1,2 and Unclassifieds
Water Production (WP)		
WP(1)	How does the road system affect access, constructing, maintaining, monitoring, and operating water diversions, impoundments, and distribution canals or pipes?	Watershed
WP(2)	How does road development and use affect water quality in municipal watersheds?	Watershed
WP(3)	How does the road system affect access to hydroelectric power generation?	Watershed
Special Forest Products (SP)		
SP(1)	How does the road system affect access for collecting special forest products?	Watershed
Special-Use Permits (SU)		
SU(1)	How does the road system affect managing special-use permit sites (concessionaires, communications sites, utility corridors, and so on)?	Watershed

NO.	QUESTION AND ISSUE AREA	LEVEL FOR QUESTION CONSIDERATION
General Public Transportation (GT)		
GT(1)	How does the road system connect to public roads and provide primary access to communities?	Forest for OML3-5 Watershed for 1,2 and Unclassifieds
GT(2)	How does the road system connect large blocks of land in other ownership to public roads (ad hoc communities, subdivisions, inholdings, and so on)?	Forest for OML3-5 Watershed for 1,2 and Unclassifieds
GT(3)	How does the road system affect managing roads with shared ownership or with limited jurisdiction (RS 2477, cost-share, prescriptive rights, FLPMA easements, FRTA easements, DOT easements)?	Forest for OML3-5 Watershed for 1,2 and Unclassifieds
GT(4)	How does the road system address the safety of road users?	Forest for OML3-5 Watershed for 1,2 and Unclassifieds
Administrative Use (AU)		
AU(1)	How does the road system affect access needed for research, inventory, and monitoring?	Forest for OML3-5 Watershed for 1,2 and Unclassifieds
AU(2)	How does the road system affect investigative or enforcement activities?	Watershed
Protection (PT)		
PT(1)	How does the road system affect fuels management?	Forest for OML3-5 Watershed for 1,2 and Unclassifieds
PT(2)	How does the road system affect the capacity of the Forest Service and cooperators to suppress wildfires?	Forest for OML3-5 Watershed for 1,2 and Unclassifieds
PT(3)	How does the road system affect risk to firefighters and to public safety?	Forest for OML3-5 Watershed for 1,2 and Unclassifieds
PT(4)	How does the road system contribute to airborne dust emissions resulting in reduced visibility and human health concerns?	Watershed
Recreation		
Unroaded Recreation (UR)		
UR(1)	Is there now or will there be in the future excess supply or excess demand for unroaded recreation opportunities?	Forest

NO.	QUESTION AND ISSUE AREA	LEVEL FOR QUESTION CONSIDERATION
UR(2)	Is developing new roads into unroaded areas, decommissioning of existing roads, or changing the maintenance of existing roads causing substantial changes in the quantity, quality, or type of unroaded recreation opportunities?	Forest
UR(3)	What are the adverse effects of noise and other disturbances caused by developing, using, and maintaining roads, on the quantity, quality, and type of unroaded recreation opportunities?	Forest
UR(4)	Who participates in unroaded recreation in the areas affected by constructing, maintaining, and decommissioning roads?	Forest
UR(5)	What are these participants' attachments to the area, how strong are their feelings, and are alternative opportunities and locations available?	Forest
Road-Related Recreation (RR)		
RR(1)	Is there now or will there be in the future excess supply or excess demand for roaded recreation opportunities?	Forest for general access and Watershed for site specific access
RR(2)	Is developing new roads into unroaded areas, decommissioning of existing roads, or changing maintenance of existing roads causing substantial changes in the quantity, quality, or type of roaded recreation opportunities?	Forest for general access and Watershed for site specific access
RR(3)	What are the adverse effects of noise and other disturbances caused by constructing, using, and maintaining roads on the quantity, quality, or type of roaded recreation opportunities?	Forest for general access and Watershed for site specific access
RR(4)	Who participates in roaded recreation in the areas affected by road constructing, changes in road maintenance, or road decommissioning?	Forest for general access and Watershed for site specific access
RR(5)	What are these participants' attachments to the area, how strong are their feelings, and are alternative opportunities and locations available?	Forest for general access and Watershed for site specific access
Passive-Use Value (PV)		
PV(1)	Do areas planned for road construction, closure, or decommissioning have unique physical or biological characteristics, such as unique natural features and threatened or endangered species?	Regional and Forest

NO.	QUESTION AND ISSUE AREA	LEVEL FOR QUESTION CONSIDERATION
PV(2)	Do areas planned for road construction, closure, or decommissioning have unique cultural, traditional, symbolic, sacred, spiritual, or religious significance?	Regional and Forest
PV(3)	What, if any, groups of people (ethnic groups, subcultures, and so on) hold cultural, symbolic, spiritual, sacred, traditional, or religious values for areas planned for road entry or road closure?	Regional and Forest
PV(4)	Will constructing, closing, or decommissioning roads substantially affect passive-use value?	Regional and Forest
Social Issues (SI)		
SI(1)	What are people's perceived needs and values for roads? How does road management affect people's dependence on, need for, and desire for roads?	Forest
SI(2)	What are people's perceived needs and values for access? How does road management affect people's dependence on, need for, and desire for access?	Forest and Watershed
SI(3)	How does the road system affect access to paleontological, archaeological, and historical sites?	Forest
SI(4)	How does the road system affect cultural and traditional uses (such as plant gathering, and access to traditional and cultural sites) and American Indian treaty rights?	Forest and Watershed
SI(5)	How are roads that constitute historic sites affected by road management?	Watershed
SI(6)	How is community social and economic health affected by road management (for example, lifestyles, businesses, tourism industry, infrastructure maintenance)?	Forest and Community
SI(7)	What is the perceived social and economic dependency of a community on an unroaded area versus the value of that unroaded area for its intrinsic existence and symbolic values?	Forest
SI(8)	How does road management affect wilderness attributes, including natural integrity, natural appearance, opportunities for solitude, and opportunities for primitive recreation?	Forest
SI(9)	What are traditional uses of animal and plant species in the area of analysis?	Watershed
SI(10)	How does road management affect people's sense of place?	Forest
Civil Rights and Environmental Justice (CR)		
CR(1)	How does the road system, or its management, affect certain groups of people (minority, ethnic, cultural, racial, disabled, and low-income groups)?	Forest

APPENDIX E: Criteria used to determine hazard ratings for the watershed condition assessment

Table E 1 Road Hazard Potential Ratings

Rating	Definition
High Hazard	The density and distribution of roads within the watershed indicate there is a high probability that the hydrologic regime (ie., timing, magnitude, duration, and spatial distribution of runoff flows) is substantially altered. Roads within the watershed exhibit at least 3 of the following characteristics: (a) densities >0.25 miles/square mile on slope classes >45%, (b) densities >0.5 miles/square mile in middle and lower slope positions, (c) densities > 0.25 mile/square mile within 100 meters of stream channel (hydrologically connected), (d) > 1 stream crossing/mile of road.
Moderate Hazard	The density and distribution of roads within the watershed indicate there is a moderate probability that the hydrologic regime is substantially altered. Roads within the watershed exhibit 1 - 2 of the following characteristics: (a) densities >0.25 miles/square mile on slope classes >45%, (b) densities >0.5 miles/square mile in middle and lower slope positions, (c) densities > 0.25 mile/square mile within 100 meters of stream channel (hydrologically connected), (d) > 1 stream crossing/mile of road.
Low Hazard	The density and distribution of roads within the watershed indicate the hydrologic regime is substantially intact and unaltered. Roads within the watershed exhibit the following characteristics: (a) densities <0.25 miles/square mile on slope classes >45%, (b) densities <0.5 miles/square mile in middle and lower slope positions, (c) densities < 0.25 mile/square mile within 100 meters of stream channel (hydrologically connected), (d) (watershed average) < 1 stream crossing/mile of road.

Definitions:

Hydrologically Connected: Any road segment that, during a 'design' runoff event, has a continuous surface flowpath between any part of the road prism and a natural stream channel (any declivity in the land that exhibits a defined channel and evidence of scour and deposition) is a hydrologically connected road segment. This process uses proximity of roads to streams as a surrogate for identifying hydrologically connected roads to streams.

Hydrologic Regime: The timing, magnitude, duration, and spatial distribution of peak , high, and low flow runoff within a watershed.

Table E 2 Surface Erosion Ratings

Rating	Definition
High Hazard	Significant alteration of the natural sediment regime associated with surface erosion is likely or evident. Conditions are characterized by the presence of higher road densities and associated disturbance to soil and vegetation on soils highly sensitive to accelerated erosion (high - very high Erosion Hazard Ratings).
Moderate Hazard	Moderate alteration of the natural sediment regime associated with surface erosion is likely or evident. Overall disturbance is variable, with low to moderate road densities and associated disturbance to soil and vegetation on soils highly sensitive to accelerated erosion (high - very high Erosion Hazard Ratings).
Low Hazard	Minor or no alteration of the natural sediment regime associated with surface erosion is likely or evident. Overall disturbance is low and are characterized by the presence of low road densities and associated disturbance to soil and vegetation on soils highly sensitive to accelerated erosion (high - very high Erosion Hazard Ratings).

Definition:
Sediment Regime: The timing, volume, rate, and character of sediment input, storage, and transport within a watershed.

Table E 3 Mass Wasting Ratings

Rating	Definition
High Hazard	Watersheds characterized by the presence of a large number of roads on unstable geologic types. This results in a situation where it is very likely that the timing, geographic distribution, and magnitude (total volume) of natural land sliding has been significantly altered.
Moderate Hazard	Watersheds characterized by the presence of a moderate number of roads on unstable geologic types. This results in a situation where there is a moderate risk that the timing, geographic distribution, and magnitude (total volume) of natural land sliding has been significantly altered.
Low Hazard	Watersheds characterized by the presence of very few, if any, roads on unstable geologic types. This results in a situation where the natural sediment regime is likely to be intact, and it is very unlikely that roads have, or will, significantly modify the timing, geographic distribution, and magnitude (total volume) of natural land sliding in the watershed.

APPENDIX F: Noxious Weed Locations Six Rivers National Forest

Roads serve as a vector for weeds and the risk of introduction and spread is high regardless of whether the road segment is currently infected. Known infestations are shown below:

Table F 1 Noxious Weed Locations: Smith River NRA

Road #	Known Noxious Weed Occurrences
15N39	french broom
17N04	scotch broom
17N08	scotch broom, french broom
17N49	scotch broom, french broom
18N01	scotch broom, french broom
18N02	scotch broom, french broom
18N07	scotch broom
17N05	scotch broom, french broom, star thistle
17N53	scotch broom, french broom
17N62	french broom
17N62A	french broom
17N62B	french broom
17N70	scotch broom, french broom
15N39	french broom
17N04	scotch broom
17N08	scotch broom, french broom
17N49	scotch broom, french broom
18N01	scotch broom, french broom
18N02	scotch broom, french broom
18N07	scotch broom, meadow knapweed
17N05	scotch broom, french broom, star thistle
17N53	scotch broom, french broom
17N62	french broom
17N62A	french broom
17N62B	french broom

Table F 2 Noxious Weed Locations: Orleans/Ukonom Ranger District

Road #	Known Noxious Weed Occurrences
10N12	scotch broom; approx. 2 mi. serpentine
10N28	star thistle, dyer's woad, scotch broom
10N70	star thistle and dyer's woad at beginning
10N72	star thistle and dyer's woad at beginning
10N74	star thistle and dyer's woad at beginning
10N75	star thistle and dyer's woad at beginning

Road #	Known Noxious Weed Occurrences
11N11	star thistle at beginning
11N56	star thistle, dyer's woad, scotch broom at beginning
11N62	star thistle, dyer's woad, scotch broom at beginning
11N72	star thistle, dyer's woad, spotted knapweed at beginning
11N76	star thistle and dyer's woad
12N12	star thistle, scotch broom
12N20	weed - star thistle at beginning; approx. 1/2 mi. serpentine

Table F 3 Noxious Weed Locations: Lower Trinity Ranger District

Road #	Known Noxious Weed Occurrences
04N13	star thistle at intersection
04N36	star thistle at intersection
04N36	star thistle at intersection
05N01	star thistle at intersection
06N06	star thistle approx. 0.2 mi.
06N10	black locust
06N12	star thistle approx. 1.5 mi.
06N14	star thistle at intersection
06N19	star thistle approx. 1.5 mi.
06N20	star thistle at intersection
06N53	star thistle at intersection
06N70	star thistle
07N02	scotch broom 1 mi., star thistle 0.25 mi.
07N04	scotch broom 0.25 mi., star thistle 0.25 mi., black locust 0.25 mi.
07N26	star thistle at intersection.
07N30	star thistle approx. 0.2 mi.
08N01	scotch broom 0.1 mi.
08N03	star thistle at intersection
06N01	star thistle
06N08	scotch broom 0.5 mi., star thistle 3.0 mi.
07N02	scotch broom 0.5 mi., star thistle 0.1 mi.
5N22	star thistle

Table F 4 Noxious Weed Locations: Mad River Ranger District

Road #	Known Noxious Weed Occurrences
01N03	medusa head
01N08	medusa head
01N15	star thistle at beginning
01N30	star thistle at beginning
01S06	star thistle at beginning and medusa head
02N05	star thistle at beginning and medusa head
02N12	star thistle at beginning, spotted knapweed, diffuse knapweed

Road #	Known Noxious Weed Occurrences
02S05	star thistle and medusa head
02S08	star thistle
02S12	star thistle and scotch broom at beginning
03S12	star thistle at beginning
03S13	star thistle
04S15	star thistle
27N12	medusa head
27N33	medusa head
01N70	star thistle at beginning
01S50	star thistle at beginning
01S51	star thistle at beginning
01S52	star thistle at beginning
06N01	star thistle
27N02	medusa head
29N30	star thistle at beginning

APPENDIX G: General Road Assessment Evaluation Criteria

Interdisciplinary teams on each Ranger District evaluated each OML 3, 4, and 5 road for administrative need and potential resource risk, using existing GIS layers and resource-specific databases. Each resource evaluated the roads based on first these general criteria below and then using the more specific criteria found in Chapter V.

Purpose:
These evaluation criteria can be used to assess administrative and public access and travel needs for future management of the forest transportation systems, as well as assess resource protection concerns. They are to be used in part or in their entirety as a starting point to involving external and internal audiences in the Roads Analysis Process and incorporating their issues and concerns into that process. FSM 7712.13b (1) provides specifics on what should be considered at this scale.

Administrative Need

- Is this road critical or important for fire management?
- Is this road needed for timber management activities? (Sale planning, logging, administration)
- Does this road provide access for range permittee needs?
- Is this road needed to provide access for Special Uses?
- Is this road needed for other administrative purposes (monitoring site, habitat improvement area etc)?
- Does the road or other factors pose a safety problem to users? (List safety problems)
- Will the regulation of changes in the accessibility of this road pose enforcement problems?

Public Access Need

- Does or would this road serve developed recreation?
- Does or would this road serve dispersed recreation?
- Does this road provide access for woodcutting opportunities?
- Are there any social issues potentially affected such as socioeconomic impacts and accessibility for handicapped persons.
- Does this road provide access for tribal and other users? (List other users and reason for use, i.e. gathering materials for basket weaving)

Administrative and Public Access Need

- Does this road connect with other County or State roads?
- Is this a "cost share" road?
- Does the road provide access to private land?

Resource Protection Concerns

- Are there any natural resources that need to be protected? (POC, wildlife, fisheries, water quality – landslide risks, surface erosion)
- Are there any chronic maintenance problems that may need more extensive repair?

APPENDIX H: Priorities for Recommendations and Maintenance Needs

Priorities were developed by District Interdisciplinary teams based on the information gathered during this analysis process on road condition and administrative need. These road management recommendations will be used as a basis for proposed actions and disclosed in future appropriate NEPA documents, and will be completed as funding allows.

Smith River National Recreation Area (and Gasquet District)

Table H 1 Recommended Project (in order of priority)

No.	Road No.	Description of work and comments / RECOMMENDATIONS
1	16N02	Reconstruct intersection with Ship Mountain lookout road (16N02A).
2	18N01	Shelly Creek Campground road. The upper end along the creek is sloughing off and needs repair. Need to close upper end to vehicle traffic.
3	17N21	Need to block access to the meadows to prevent damage by off-road vehicles. Resurface road for water hole access for fire.
4	15N36	Improve access to Muslatt Lake as water source for fire.
5	18N08	Resurface the road for water access for fire.
6	16N02	Add finer gravel along Doe Flat road to reduce the number of flat tires.
7	None	Add Madrona Camp Road to System as OML 3
8	None	Add Howard Griffin Bridge Road to System as OML 3
9	None	Add Grassy Flat Old Bridge Road to System as OML 3
10	None	Add 18-Mile Creek Road to System as OML 3
11	14N82	Yurok Experimental Forest; gated and has low administrative need. Change maintenance level from L3 to L2
12	18N02	County road #316, drop number from FS system (needs resurfacing).

Table H 2 Recommended Maintenance (in order of priority)

No.	Road No.	Description of work and comments / RECOMMENDATIONS
1	16N02	Ship Mountain Road; Chip seal needs repatching; fix ruts and ditches
2	15N36	Access to Muslatt Lake; fix steep grade and repair slump. Needs blading or resurfacing
3	15N39	Access to South Kelsey trail. Needs resurfacing or blading (rutted with a lot of potholes)
4	15N34	Access to Gunbarrel trail. Needs brushing and slide removal
5	16N03	Fox Ridge road; drainage problems, needs road reshaping and additional culvert/cross drains in the area approximately ½ miles from intersection with 16N02
6	17N22	Blading, crossings need cleaning
7	17N08	Little Jones Creek road; drainage problems, needs berms and inboard

No.	Road No.	Description of work and comments / RECOMMENDATIONS
		ditches removed; blading
8	17N49	Gasquet Mountain road; too steep in some areas, soft spots in others causing road damage
9	15N59	Big Flat campground- fix potholes
10	17N04	Tie road; resurface
11	17N07	Coon Mountain road; resurface
12	15N01	Go Road; clean/replace culverts, repair cracked surface, clear rocks
13	17N27	Blading
14	18N07	Knopki Creek road; routine maintenance
15	14N01	Red Mountain road; brushing
16	17N21	Resurface

Table H 3 Recommended Changes to OML or Roads to be added to System

Road Number	Current OML	Proposed OML	Description of road portion to be changed
14N82	3	2	Entire Road
18N01	3	2	Entire Road
Assign	N/A	3	Paved river access at Madrona Camp
Assign	N/A	3	Paved river access at Howard Griffin Bridge
Assign	N/A	3	Paved river access at 18 Mile Creek Bridge
Assign	N/A	3	Paved river access at Old Grassy Flat Road Bridge

Lower Trinity Ranger District

Table H 4 Recommendations for Projects and Maintenance (in order of priority)

No.	Road No.	Description of work and comments / RECOMMENDATIONS
1	7N02	Repair road surface between the county road and the 8N03 turn off to Horse Linto Campground
2	7N02	Repair road surface from where it ascends towards Ziegler Point from the south
3	8N03	Blade the road (or surface if funding allows) from beginning to the Horse Linto Campground
4	7N02	Evaluate intersection for possible reconstruction at the junction of 8N03 and 7N02
5	7N04	Evaluate intersection for possible reconstruction at the junction of 7N04 and 6N10

Table H 5 Recommended Changes to OML or Roads to be added to System

Road Number	Current OML	Proposed OML	Description of road portion to be changed
6N01	2	3	Portion that runs along the northeast side of Pilot Creek watershed

Road Number	Current OML	Proposed OML	Description of road portion to be changed
Rt. 6	2	3	Change all locations that are currently shown as OML2 including the "Million Dollar Bridge"
6N06	3	2	From MP 14.6 to end
6N20	3	2	From Oak Knob to end
6N21	2	3	First portion serving East Fork Campground
8N03	3	2	Portion coming out of Hoopa to Tish Tang Trailhead
4N31	3	4	From intersection with 4N36 to end
7N10	3	2	
7N51		Remove	Remove road from database – Hoopa Valley Reservation Road
10N02spur	N/A	2	Spur that accesses Bear Hole Trailhead
7N31	3	2	Entire Road
9N04	2	3	Portion between Hoopa boundary and 10N02
10N02	3	2	From Bear Hole Trailhead to end of road

Mad River Ranger District

Table H 6 Recommendations for Projects and Maintenance (in order of priority)

No.	Road No.	Description of work and comments / RECOMMENDATIONS
1	6N01	Repair and replace road signs
2	29N30	Repair and replace road signs
3	27N02	Repair and replace road signs
4	1S07	Repair and replace road signs
5	1S06	Replace 54" x 94' failing culvert at MP 1.0
6	1S11	Spot rock and blade
7	1S06	Inventory and replace worn out culverts (approx 30 culverts with large fills)
8	1N30	Repair or remove cattle guard; repair cracks in pavement; possible culvert replacement
9	1N08	Inventory and replace worn out culverts (approx 30 culverts with large fills)
10	2S08	Repair road slump at MP 6.49
11	2S12	Needs resurfacing, rock source at MP 1.7 needs to be crushed
12	27N02	Repair/replace pavement as needed
13	3S15	Needs resurfacing; rock source at MP 2.4
14	1N70	Repair or repave after waterline upgrade is complete
15	6N01	Asphalt seal from 4N12 to HWY 36
16	29N30	Remove 150 cubic yards of rock ravel
17	27N02	Remove 5000+ yards of rock ravel; area past Blue Jay Mine is a good rock source
18	6N01	Fog stripe on fill side of road

No.	Road No.	Description of work and comments / RECOMMENDATIONS
19	2N14	Rock section of road from MP 3.0 to terminus at MP 5.43

Table H 7 Recommended Changes to OML or Roads to be added to System

Road Number	Current OML	Proposed OML	Description of road portion to be changed
1N15	3	2	From MP 1.26 to end
1N03	3	2	From MP 6.4 to end
2N14	3	2	From MP 3.0 to end
27N12	3	2	From junction with 2N13 (~MP 2.6) to end
2S04	3	2	Entire Road
2S08	3	2	From MP 6.49 (junction with 1S07) to terminus

Orleans Ranger District

Table H 8 Recommended Project (in order of priority)

No.	Road No.	Description of work and comments / RECOMMENDATIONS
1	15N01	Culvert upgrades and other routine maintenance
2	14N03	Culverts are completely rotted out, culvert upgrades, diversion dips, outslope and take out inboard ditches, and other routine maintenance
3	11N05	Existing asphalt is alligator cracks and needs to be repaved. 12 – 14' wide
4	12N13	Culvert upgrades, ditch clean out, and other routine maintenance
5	12N01	ditch cleanup and some culvert upgrades
6	10N01	Culvert upgrades and rolling dips, patching/paving on bottom 10 miles
7	13N01	Has existing NEPA, Upgrade 12 culverts, cleanout existing culverts, pull ditch line
8	10N10	Culvert and ditch clean out, rocking, grading and brushing, needs some culvert upgrades
9	10N02	Culvert upgrades, ditch clean out, and rolling dips
10	10N03	Culvert upgrades
11	13N18	Rock surface gone and culverts are failing, need culvert upgrades, rebuild ditchlines, and other routine maintenance
12	10N05	Ditch cleanout and some culvert upgrades. Need further discussion in future with fire and timber for possible decommissioning.
13	12N10	Grading and rocking
14	11N56	Re-rock or pave (not paved now)
15	10N20	Paving
16	10N70	Paving
17	10N28	Seasonal maintenance and riprap to armor right bank for treatment facility

Table H 9 Recommended Changes to OML or Roads to be added to System

Road Number	Current OML	Proposed OML	Description of road portion to be changed
10N20	2	3	
10N28	2	3	
11N76	2	3	
11N72	2	3	
11N54	2	3	
10N51	4	2	
10N13	3	2	From 10N13A to terminus of 10N13
10N75	3	2	Consider decommissioning road loop within campground (0.5 mile from existing gate) after site-specific analysis

Ukonom Ranger District

Table H 10 Recommended Project (in order of priority)

No.	Road No.	Description of work and comments / RECOMMENDATIONS
1	15N17	Clean plugged culverts immediately; maintain with improvements for drivability, outslope sections, stormproof and/or upgrade; remove wildlife gate, existing culverts are aluminum
2	15N17	Stormproof and/or upgrade (paved)
3	13N11	Stormproof and/or upgrade
4	13N11	Remove both wildlife gates, upgrade/stormproof as needed
5	12N52	Outslope and improve drainage, stormproof and/or upgrade
6	14N01	Maintain with improvements for drivability, outslope sections; stormproof and/or upgrade
7	13N12	Stormproof and upgrade
8	13N18	Resurfacing, stormproof and upgrade culverts
9	Non-Sys.	Oak Bottom – upgrade road to meet OML 3
10	Non-Sys.	George Gary – upgrade road to meet OML 3
11	Non-Sys.	Brannon's Bar – upgrade road to meet OML 3
12	Non-Sys.	Nordheimer – upgrade road to meet OML 3, needs rocking and reshaping (possibly partner with Siskiyou County)
13	13N13	Stormproof and upgrade
14	13N08	Remove wildlife gate @ mp 0.1
15	14N21	Remove 2 wildlife gates

Table H 11 Recommended Changes to OML or Roads to be added to System

Road Number	Current OML	Proposed OML	Description of road portion to be changed
14N21	3	2	Consider decommissioning after site-specific analysis
13N08	3	2	

Road Number	Current OML	Proposed OML	Description of road portion to be changed
12N44	1	3	
11N17	3	4	Oak Bottom Camp Ground - currently paved
12N01		Remove Portion	Keep first 0.25 miles including the bridge over the Salmon River and remove all portions of decommissioned road from Road Database
Non-Sys.	Oak Bottom	3	River Access
Non-Sys.	George Gary	3	River Access
Non-Sys.	Brannon's Bar	3	River Access
Non-Sys.	Nordheimer	3	River Access

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APPENDIX J: Glossary of Terms and Abbreviations

ACS – Aquatic Conservation Strategy

Aggregate - crushed rock material, used for road surfacing

Berm- Native or aggregate material built up adjacent to the traveled roadway. Reasons for installation vary and can include surface water control, hazard mitigation (in lieu of guardrail) or temporary stockpiling of slide debris.

Blading- road surfacing activity to improve drivability

BD – Brush Disposal funds; collections made from timber sales and earmarked for fuel treatments in the sale area

BMP – Best Management Practices

Brushing- removing brush along side of roadway to improve visibility

Chip seal- thin layer of hard surface material that includes an emulsified material that adheres the material's particles to each other and the road surface it is place on.

Crossdrains- drainage structure (culvert) located outside of a stream channel

Cultural use- access to areas with significant prehistorical, historical, or contemporary Native American use

Cutbank- bank on uphill side of road that is a result of cutting into the hillside to create a road surface

Decommissioning – permanently closing a road to vehicular use and left in a hydrologically maintenance free condition. Decommissioning will include activities such as waterbarring, outsloping, decompaction of road surface, removal of drainage structures, and road barricades as needed.

Dispersed recreation- camping in areas with little or no facilities

Diversion dips- (also drivable dips) constructed ditches or low spots across the road that allow water to flow across the road during high flow events or in the event that the culvert was plugged to allow the water to be diverted back into the channel.

Diversion potential- the potential for water to be diverted away from drainage structures, causing erosion of road surface

Fill- material brought to the site or moved within the site to build up a road surface.

FS (or USFS) – United States Forest Service

FSM – Forest Service Manual

FSH – Forest Service Handbook

Grading- road surfacing activity to improve drivability

Headwall area- usually at the top of swales and small channels where the natural upslope progression of a channel ends at a steep vertical face

HWY - highway

Inboard ditches- drainage ditches located on the uphill side of the road

KV – Knudsen-Vandenburg Act funds; collections made from timber sales and earmarked for sale area improvement

LRMP – Land and Resource Management Plan

LSR- Late Successional Reserve; land allocation designated for protections of species dependent on older-aged forests

Mass Wasting – large land area erosion and failures

Matrix- land allocation designated for timber production

Moderate Speed – 25 miles per hour

MOU - Memorandum of Understanding, a formal agreement between entities

MP- milepost

Mtce - maintenance

NEPA- National Environmental Policy Act; a decision making process required before projects can be implemented

NFS – National Forest System

OHV- off highway vehicles, designed to travel over rough terrain

OML- Operational Maintenance Level; the type of maintenance required for specific road conditions. Levels are from 1-5, with 5 being the highest amount of maintenance required.

Outslope – roads that are sloped towards the downhill side of the roadway to better match the natural drainage patterns and minimize the potential for diversion.

POC - Port Orford cedar

PCT – Precommercial thinning; thinning in plantations to increase growth

Riprap – large rock (generally 8" diameter or larger) used to stabilize slopes or slow down the movement of water

Road prism – cross section of roadway including cut or fill slopes, subgrade, subbase, surfacing, ditches, and other drainage structures

Rocking – replacing of or adding to the road wearing surface

ROS – Recreation Opportunity Spectrum

Slough - vertical surface layer is loose and eroding

Slumping - road section failures

Stormproof - improve drainage patterns to reduce erosion during storm events

Tanker fill/ Water source - access to pond or stream of sufficient depth to fill water tankers for fire fighting purposes

Unclassified road- A road that is not constructed, maintained, or intended for long-term highway vehicle use, such as roads built for temporary access and other remnants of short-term use roads associated with fire suppression; timber harvest; and oil, gas, or mineral activities; as well as travel-ways resulting from off-road vehicle use.

Upgrade culvert - increase the size of a culvert to handle larger flows (storm events)

USFS (or FS) - United States Forest Service

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