United States
Department of
Agriculture

Forest
Service

September 2015

Rogue River-Siskiyou National Forest Forest-wide Travel Analysis Report

Rogue River-Siskiyou National Forest
Oregon

For more information, contact:
Rogue River-Siskiyou National Forest
3040 Biddle road
Medford, OR 97504
541-618-2200

Table of Contents

Appendix M: Roads Analysis Process Summary

List of Tables

Executive Summary

This report documents the information and analysis procedure used for the Rogue River-Siskiyou National Forest (R-S NF) travel analysis. This analysis is designed to provide decision-makers with information to develop a safe road system responsive to public needs and desires, affordable and efficiently managed, have minimal negative ecological effects on the land, in balance with available funding for needed management actions, and meets Forest Plan objectives. This analysis and report is not a decision document. All road-related decisions must go through the NEPA process with public involvement.

The Travel Management Rule, published in the Federal Register, November 9, 2005, updates the 2001 Road Management Rule and Policy regulations pertaining to Forest Service management of motor vehicle use.

Transportation analysis is a six-step process, described in Forest Service Handbook 7709.55 Chapter 20, Travel Analysis. The steps are designed to be sequential, with an understanding that the process may require feedback and iteration among steps over time.

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

The process provides a set of possible issues and analysis questions with answers that can help managers make choices about road system management.

The current revision of agency policies combines the accepted roads analysis process with the analysis of motorized trails and areas as the TAP process. Subpart B of the Travel Management Rule requires each administrative unit (National Forest, National Grassland, Ranger District, etc.) to designate NFS roads, NFS trails, and areas on NFS lands that are open to motor vehicle use by class of vehicle and, if appropriate, by time of year (36 CFR 212.51). Travel analysis is intended to complement and integrate existing laws, policy, guidance, and practice into the analysis and management of roads on the national forests.

This report documents the forest-wide maintenance level (ML) 1-5 travel analysis on the Rogue River-Siskiyou National Forest. The forest elected not to analyze motorized trails and motorized use areas in this TAP. Analysis of unauthorized routes is not a requirement of the travel management rule. The Rogue River-Siskiyou National Forest has not completed an inventory and elected to not include unauthorized roads in this TAP. Unauthorized routes have not been geographically located, mapped locations are not known.

Travel Analysis is a tool that provides data for subsequent site specific project environmental analysis. TAP is not a NEPA process, rather it is an integrated ecological, social, and economic approach to transportation planning, addressing both existing and future roads, trails and motorized recreation areas. This TAP is a broad-scale analysis that encompasses the entire administrative unit. TAP provides a comprehensive inventory and road/trail-specific disposition recommendation to match the transportation system to the desired future condition, as determined through existing direction, public input, and agency resource specialist guidelines. This TAP report provides a comprehensive review and identifies opportunities for changes to the existing road system,

TAP is intended to identify opportunities for the national forest transportation system to meet current and future management objectives, and to provide information that allows integration of ecological, social, and economic concerns in future decisions. TAP is tailored to local situations and landscape conditions identified by forest staff members, coupled with public input.

The outcome of the TAP is a list of opportunities for making changes to the forest transportation system to better reflect desired conditions for the future. A thorough, more site-specific project analysis would be used during National Environmental Policy Act (NEPA) planning to evaluate the direct, indirect and cumulative effects a proposed action could have on the existing transportation system.

The working group listed in Appendix J, assigned to this project, developed the Travel Analysis Process. After reviewing existing planning documents for the forest, and considering available resources, it was determined that the appropriate scope of analysis would include all system roads within the Rogue River-Siskiyou National Forest System (USDA 1989, USDA 1990). The analysis period is set at fifty years for needs, effects, and implications (Appendix J).

Summary of Issues

Issues were identified using internal Forest Service resource specialist input and public involvement results during forest plan revision and travel management planning. Over the years roads and road-related activities have led to many issues in management of the Rogue River-Siskiyou National Forest. These issues have been documented in various Project Environmental Analyses, Environmental Impact Statements, Land Management Plans, and other management plans and studies. Issues identified include:

- Inadequate road maintenance funding
- water quality and erosion
- Botanical areas and special plant habitats
- Public safety
- Motorized opportunities
- Impacts on inventoried roadless areas
- Soils, site productivity (the effect or motorized use)
- Aquatic conservation strategy (meeting objectives)
- Air quality
- Invasive Non-native plants
- Fire risk, access for both suppression and prevention
- Dust and asbestos
- Emissions
- Invasive pathogens (Port Orford cedar)
- Terrestrial wildlife including listed species
- Managed indicator species
- Other special or rare and uncommon terrestrial wildlife
- Fisheries and aquatic species
- Visuals
- Sound levels
- Concerns about maintaining current access to mining claims
- Cultural resources
- Climate change
- Wild and scenic rive

Summary of Recommended Actions Responding to Issues

- Reduce road miles that need to be maintained, or reduce maintenance levels to reduce maintenance costs
- Leverage funds to increase maintenance capabilities
- Identify any roads that could be transferred to county jurisdiction
- Maximize cooperation from landowners by proposing reciprocal easement where needed
- Enter into a special use agreement with landowners, where the permittee performs maintenance.
- Identify and retain roads for fire control including prescribed burns and wildfire suppression.
- Maintain access to National Forest recreation sites for public use.
- Restrict motorized vehicle use to designated roads through travel management.
- Use signs, physical barriers and other traffic control devices to discourage unauthorized road use.
- Transfer jurisdiction and maintenance to permit holders.
- Consider rerouting existing roads that impact important heritage sites.
- Reduce open road miles in key wildlife habitat.
- Place seasonal restrictions on roads in important wildlife areas.
- Reduce road width and maintenance level to minimum needed for safe vehicle travel and to meet the intended need in sensitive wildlife areas and other resource areas.
- Maintain road signs in accordance with handbook direction.
- Install route numbers on all system road junctions to assist users to comply with motor vehicle use regulations.
- Identify, and effectively close, infrequently used roads to reduce road maintenance costs.
- Monitor roads after barriers are installed and other mitigation measures are implemented.
- During the NEPA process for management activities, consider closing (ML 1) some open roads in the project area to reduce maintenance costs.

Other possible management actions not directly related to identified issues

- Provide information and education about motor vehicle regulations and responsible use of motorized vehicles on the National Forest.
- Use enforcement to curtail off-road driving.
- Provide information to help public users understand problems created by off road driving.
- Rehabilitate areas damaged by off-route driving.
- Update and maintain the Motor Vehicle Use Map.

Analysis Performed

Road benefit and risk issues were identified by the interdisciplinary team (IDT). The IDT used the risk-benefit assessment to rank roads based on benefits (administration and public use, facilities access, recreational opportunities and developed site access, fire suppression, vegetation management and other authorized uses) and risks (hydrologic and aquatic, wildlife, botany (including TES plants and invasive species) and Forest Plan management area direction including cultural resource impacts). The IDT then developed science based questions applicable to their specialty (Step 4, Assessing benefits, problems and risks - USDA 1999) to build issue

statements suitable for GIS analysis and evaluation criteria to determine benefit and risk ratings for each road. Maintenance funding was evaluated to determine existing and future needs, current funding and predicted future maintenance needs.

Key Results and Findings

Through the travel analysis process, the IDT ranked roads based on benefits and risks for each resource.

Four resource benefit areas were identified and evaluated.

Recreation
- Developed Sites
- Dispersed Camping
- Trailheads
- Other Recreation Opportunities

Fire and Public Safety
- Fire Facilities
- Escape Routes
- Fire Prevention
- Fire Suppression

Vegetative Management
- Late Succession Reserves (LSR).
- Matrix Lands (Potential Areas for Resource Enhancement
- Adaptive Management Area (AMA)

Other Needs
- Legal Requirements
- Administrative Sites
- Range Improvements
- Mineral Extraction
- Cultural, Historical Uses

Four resource risk criteria (adverse effects) were identified and evaluated.

Aquatics
- Sediment Delivery
- Riparian Reserves
- Fish Passage
- Key Watersheds

Terrestrial Wildlife
- Late Succession Fragmentation
- Wildlife Travel Corridors
- Threatened, Endangered, and Sensitive Species
- Wildlife Harassment

Botanical
- Botanical Resource Viability
- Invasive Plants
- Port Orford Cedar

Management Areas
- Roadless Areas
- Wild and Scenic Rivers
- Cultural Resource Protection

A complete road list with each resource rating and combined total risk and benefit rating for each road is included in Appendix A. Appendix D contains maps displaying the IDT road management opportunities.

The IDT reviewed the combined risks and benefits for each road (Appendix A) and identified the following opportunities based on the matrix rule set:

- There are 5,183 miles of system roads on the R-S NF included in INFRA record.
- 913 miles, 18 percent of road miles were rated high benefit; 1,303 miles, 25 percent were rated medium benefit; 2,967 miles, 57 percent, were rated low benefit
- 541 miles, 10 percent of road miles were rated high risk; 2,543 miles, 49 percent were rated medium risk; 2,099 miles, 41 percent, were rated low risk
- The IDT reviewed road miles by maintenance level in these categories and developed a GIS analysis strategy to identify management opportunities for each road group: low risk/low benefit (LL), medium risk/low benefit (ML), high risk/low benefit (HL), low risk/medium benefit (LM), medium risk/medium benefit (MM), high risk/medium benefit (HM), low risk/high benefit (LH), medium risk/high benefit (MH), or high risk/high benefit (HH). Roads in the high and medium risk categories with low and medium benefits should be considered for mitigation to reduce resource risk, closed or decommissioned. Management opportunities for each road are included in Appendix A.
- 618 miles of ML-1 and 62 miles of ML-2 roads (680 total miles, 13 percent), of current system roads were assessed by the IDT to have low benefit are likely not needed for future resource management purposes. These roads should be considered for decommissioning through a site-specific NEPA process.
- 847 miles of ML-2 roads, 16 percent, should be closed or changed to ML-1.
- 150 miles of ML-3 roads should be changed to ML-2.
- 3,507 remaining road miles (70 percent of total road miles) should be mitigated to reduce risks where needed and maintained at existing ML.
- 4,504 miles of system roads (INFRA data base) should be retained as likely needed for the future, this is a 13 % reduction in system road miles

Total road miles, percent of miles and miles for each maintenance level with management recommendations for each matrix cell category are shown in Step 4, Tables 9 and 10.

How the Report Will Be Used

Travel analysis results will assist the Rogue River-Siskiyou National Forest managers to address issues related to road management. Travel analysis results will be used for planning future site-specific actions, project analyses and decisions. TAP is not a decision process; final road management decisions would be made through site-specific, project level, resource analysis, ground truthing and public scoping under the NEPA process.

Travel Analysis products inform proposals for long-range strategic planning adjustments to forest travel management direction and to the physical forest transportation system. These adjustments may be evaluated through subsequent environmental analysis and decision making. Travel analysis is a tool that provides data for project level environmental analysis, with the intention that individual projects are site specific focused and address direct, indirect and cumulative activity effects.

Project Introduction

Areas included for analysis under the Forest Level Travel Analysis Process include the entire Rogue River-Siskiyou National Forest (Siskiyou Mountains Ranger District, High Cascades Ranger District, Wild Rivers Ranger District, Gold Beach Ranger District, and Powers Ranger District). Total analysis area is about 1.85 million acre (USDA 1990, USDA 1989).

This analysis incorporated the 2004 Roads Analysis that was based on 6th field HUC watersheds consolidated into District land units. This division reflects the different habitat types, environments and management issues that exist on the Forest. The 6th field HUC watersheds are the primary focus of environmental analyses on this Forest. These watershed units were the base for this analysis with maps and data reports consolidated by District (Appendix J).

The Rogue River-Siskiyou National Forest Line Officers will use this Forest Level Travel Analysis report when planning future NEPA projects where laws, regulations, manual and handbook direction require that a Travel Analysis be completed prior to a NEPA project inception. This Travel Analysis Report analyzed all 5183 miles on the Rogue River - Siskiyou National Forest. The forest leadership team elected not to include motorized trails or motorized use areas in this analysis (Appendix J).

This Forest travel analysis examined 5183 existing NFS road miles as they exist on the landscape, identified at the following Maintenance Level:

- Maintenance Level 5 passenger car roads – 40 miles
- Maintenance Level 4 passenger car roads – 168 miles
- Maintenance Level 3 passenger car roads – 789 miles
- Maintenance Level 2 high clearance roads – 3477 miles
- Maintenance Level 1 long term storage roads (closed) - 710 miles

In evaluating and identifying management opportunities for roads, the IDT (Appendix J, RSNF analysis directions) elected not to determine if any roads should be converted to trails in this assessment. Road conversion to trails would be decided at project level analysis (Appendix J). Road management decisions would be done under future NEPA project analysis.

As noted above, this Travel Analysis evaluated the following road benefits and risks.

Benefits (access)

- Fire management; suppression, detection, facilities, escape routes
- Vegetation management: late succession reserves, matrix lands, AMA
- Recreation; developed sites, trailheads, dispersed sites
- Other authorized uses and administrative facilities, legal requirements, range improvements, mineral extraction, cultural, historical uses

Risks (adverse effects)

- Aquatic; (included) late successional fragmentation, wildlife travel corridors, T and E species, wildlife harassment
- Terrestrial wildlife; (included) late successional fragmentation, wildlife travel corridors, T and E species, wildlife harassment
- Botanical; botanical resource viability, invasive plant management: plant pathogens
- Management Areas; (Forest Plan direction) roadless areas, wild and scenic river, cultural resources

Step 1: Setting up the Analysis

Purpose

The purpose of this section is to:

- Identify the project area and state objectives
- Develop a process and analysis plan
- Address information needs
- Clarify technical specialists roles

This travel analysis process was developed to inventory, analyze and evaluate system road benefits and risks identified by Forest resource specialists and public comments in addition to identifying opportunities for improved management of system roads.

Project Area and Objectives

The travel analysis process (TAP) was conducted for all maintenance level (ML), 1 to 5 roads on the Rogue River-Siskiyou National Forest. The purpose of the analysis is to provide resource information for managing roads that are safe and responsive to public needs and desires, conform to the Rogue River-Siskiyou Land Resource Management Plan (LRMP -USDA 1990, USDA 1989), are efficiently administered with minimal negative ecological effects on the land, reflect funding levels available for needed management actions and comply with state and federal regulations and meet statutory regulations.

The TAP is intended to be a broad scale comprehensive look at the transportation network. The main objectives of the TAP are to:

- Identify opportunities for making changes to the forest transportation system that balance the need for access while minimizing risks by examining important ecological, social, and economic issues related to roads
- Develop maps, tables, and narratives that display transportation management opportunities and strategies that address current and future access needs, and environmental concerns.
- Identify needed changes by comparing existing road conditions to desired road conditions.
- Identify opportunities for change that will inform travel management decisions in subsequent NEPA documents.
- Provide a list of opportunities and background information necessary for the identification of the minimum road system (MRS) needed for safe efficient travel, administration, use and protection of National Forest System (NFS) lands directed in 36 CFR 212.5(b)(1).
- Provide a list of opportunities and analysis background necessary for the identification of the roads on lands under Forest Service jurisdiction that are no longer needed to meet forest resource management objectives and therefore should be decommissioned or considered for other uses, per 36 CFR 212.5(b)(2).

Scope of the analysis: This analysis includes all NFS roads, maintenance level 1-5, that are under the jurisdiction of and maintained by the Forest Service, including roads under cost-share agreements. Many additional routes provide access to National Forest lands including other Federal, State and County roads and private routes. These routes must be considered in the planning effort but do not contribute to the financial sustainability of the NFS system. While the analysis included connections to other roads (private, county, state or other agency jurisdictions)

opportunities associated with the travel analysis process under Subpart A only apply to NFS routes.

The investment costs for road improvements, decommissioning, storm damage repair, deferred maintenance, and other costs associated with changing/reducing maintenance levels was identified for the total investment cost needed, but was not included in the annual maintenance cost analysis. The financial analysis was based on routine annual maintenance work funded with routine annual maintenance funding.

The analysis area for this TAP includes the entire Rogue River (632,000 acres) (USDA 1990) – Siskiyou (1,092,300 acres) (USDA 1989) National Forest, 1,852,000 total GIS acres (vicinity map, Appendix B).

IDT Specialists

An interdisciplinary team (IDT) of forest specialists was assigned to the TAP. Team members and their primary analysis role are listed below (Project Initiation Letter, Appendix J).

Peggy O'Keefe	Team Leader
David Krantz	Forest Planner
Susan Maiyo	Forest Fish Biologist
Chris Parks	Forest Hydrologist
Dave Clayton	Forest Wildlife Biologist
Wayne Rolle	Forest Botanist
Dave Zimmerman	Forester
Ron Lamb	Fire and Fuels Planner
Les Moscoso and Brian Long	Recreation Specialist
Virginia Gibbons	Public Affairs Officer

Oversight Team Members include of all Staff Officers and District Rangers.

Contributors include District or Zone Specialists as assigned by District Rangers or Line Officers.

A Contract Transportation Planner (Tim Chesley) developed and coordinated the GIS modeling and financial analysis.

Travel analysis is intended to be based on science. Team members located, interpreted, and used relevant scientific literature to disclosed assumptions and describe road benefit and risk criteria.

Process Plan

TAP followed the six-step process described in Forest Service Handbook FSH 7709.55 Chapter 20, Travel Analysis.

Travel Analysis requirements used are further described in:

- FSM 7700 Travel Management;
- FSM 7710 (Travel Planning);
- FSM 7730 (Road Operations);
- FSM 2350 (Motorized trails);
- FSH 7709.55 (Travel Analysis);
- FSH 7709.59 (Road Operations);
- FSH 2309.18 (Motorized trail Operations);
- 36 CFR 212, 251, 261 Travel Management Final Rule
- Executive Order 11644 - Use of Off-Road Vehicles on Public Land – Feb. 8, 1972;
- Executive Order 11989 - May 24, 1977 Amends EO 11644 setting forth an exclusion from the definition of off-road vehicles for any fire, military, emergency, or law enforcement vehicle when used for emergency purposes and Sec. 9 Special protection of the public lands.
- National Environmental Policy Act of 1969

Administrative units are to use an authorized science-based analysis process conducted by an interdisciplinary team to inform planners and decision makers of road system opportunities, needs, and priorities that support land and resource management plan objectives. Travel Analysis includes opportunities for public participation and emphasizes interdisciplinary team identification and evaluation of road issues and opportunities. The team was formed to provide the Responsible Official with critical information needed to identify and manage a sustainable transportation system for the future.

The transportation system should be safe and responsive to public needs and desires, affordable and efficient to manage, produce minimal adverse effects on ecological processes, ecosystem health and diversity does not reduce productivity of the land, reflects available funding for needed management actions, and meets state and federal regulations.

Analysis Plan

The IDT followed these steps for the analysis:

- Review and assemble existing data.
- Verify accuracy of system road locations on maps.
- Identify and document discrepancies between on-the-ground conditions, the Forest's INFRA database, and current management direction.
- Where possible, verify existing road conditions, and associated features including surface type and impacts on other resources.
- Identify preliminary access and resource issues, concerns, and opportunities
- Identify road safety issues.
- Identify additional issues, concerns, and opportunities through previous public involvement and internal resource specialists.

- Identify opportunities for making changes to the road system based on the findings of this analysis in response to the issues identified.

Information Needs

The following information was required to proceed with the analysis:

- Accurate location of all system roads within the analysis area. For each road, the following information is needed:
    1. Existing public, permittee, or agency use
    2. Right-of-way dedication to the FS
    3. Additional right-of-way required
    4. Maintenance responsibility for the road (Forest Service, County, City, volunteer group, or State)
- Assessment of current opportunities, problems, and risks for all roads in the analysis area
- Soil, water resources, invasive species, environmental issues, and biological communities
- Public access and recreational needs and desires in the area, including access for nearby landowners
- Current observed road uses
- Current road management objectives
- Areas of special or sensitivity resource values
- Best management practices for the area
- Current forest plan and other management direction for the area
- Agency objectives and priorities
- Interrelationship with other governmental jurisdictions for roads
- State laws that regulate motor vehicle use on and off public roads
- Applicable federal, state, and local laws
- Public and user group values and concerns
- Forest scale and any project level roads analysis
- Cultural resources

Step 2: Describe the Situation

Purpose

The purpose of step 2 is to:

Describe existing road system

Describe existing management direction

Describe road maintenance levels

Existing Road System

The Rogue River-Siskiyou National Forest has 5183 miles of maintenance level 1 through 5 system roads in INFRA. This TAP reviewed and analyzed the existing ML1 through ML5 roads shown on Maps in Appendix C. Motorized trails are not addressed in this TAP. Attributes for each system road are included in Appendix A.

Existing Direction for Road Management

A. General

Travel analysis is focused on identifying needed changes to the forest transportation system. Existing National Forest System road direction for restrictions, prohibitions, and closures to motor vehicle use are included in the LRMP and shown on the road data spreadsheet, Appendix A attribute table.

Existing laws and regulations, official directives, forest plans, forest orders, and forest-wide or project-specific road decisions determine motorized routes and areas open to public motorized travel. Road and motorized trail management objectives are shown on forest maps, recreation opportunity guides, tabular databases, travel management plan and other sources. Road management attributes are identified and included in the INFRA database. The LRMP describes existing and planned road densities for timber harvest and other resource management needs.

B. Road Attribute Descriptions

Open Road

Existing forest system roads open for public motorized use are included in the Forest INFRA database (an Oracle Database) containing information on all roads and improvements on National Forest lands). Data tables include the following attributes:

- System - National Forest System Road
- Jurisdiction - Forest Service
- Route Status - Existing
- Operational Maintenance Level - 2 through 5

Closed Road

Closed roads have been closed to motor vehicle traffic for at least a year but are necessary for future activities. They appear in the Forest's INFRA database under the following categories:

- System - National Forest System Road
- Jurisdiction - Forest Service

- Route Status - Existing
- Operational Maintenance Level – 1

Decommissioned Road

Decommissioned roads have some type of physical closure at their entrance (berm, etc.), or may be completely obliterated or recontoured. They appear in the Forest INFRA database under the following categories:

- System - National Forest System Road
- Jurisdiction - Forest Service
- Route Status - Decommissioned
- Operational Maintenance Level - 1-5

To return a decommissioned road to service as a system road (or as a temporary use road) the NEPA process must be followed to allow motorized travel on the road.

Unauthorized Road

An unauthorized road is an existing road not included in the forest transportation atlas or database as part of the road system. These roads were usually established by various users or developed for product removal. Unauthorized roads were not inventoried, the forest leadership team decided to not analyze or include unauthorized roads in this TAP (PIL, Appendix J).

C. Motorized Trails

Designated motorized trails are shown on the Rogue River-Siskiyou National Forest Motor Vehicle Use Map. To meet the requirements of Subpart B of the Rule, the Rogue River-Siskiyou National Forest is now updating Part B travel management plan to be completed in fiscal year 2016. Requirements of Subpart B of the Rule include preparing or updating a Motor Vehicle Use Map (Appendix J). The forest leadership team decided not to analyze or include motorized trails in this TAP (Appendix J).

D. Areas

The forest leadership team decided to not analyze or include motorized use areas in this TAP (Appendix J).

E. Previous Travel Management Decisions

Opportunities to integrate other plans and analyses: Use other plans and analysis that are in process or have been completed that may provide additional information to better define benefits and/or environmental costs for individual road segments.

- 2004 Recreation Facility Master Plan
- Siskiyou Mountains Aquatic and Riparian Habitat Enhancement Project
- Applegate-McKee Bridge Watershed Legacy Roads and Trails Project (EA)
- Applegate Plantation Thin (on hold, some analysis completed)
- Bybee Vegetative Management EA
- Sucker Creek Channel and Floodplain Restoration
- Eden Ridge Timber Sales EIS
- Butcherknife/Slate Fuels Reduction Project EA
- Cascades Managed Stands EA
- Big Grayback Range Allotment EA

- East Illinois Valley Managed Stands Project EA
- Plantation Thinning and Fuels Reduction Project on Wild Rivers District (EA)
- Rustler Vegetation Management (EA)
- Wild Rivers Aquatic and Riparian Habitat Enhancement Project (on hold)

This is a stand-alone road evaluation TAP, all system roads in the INFRA database were evaluated and rated by resource specialists for benefits and risks. Roads were grouped by benefit risk categories and maintenance level (Table 10 below) for management opportunities.

Road Maintenance Levels

The Forest Service categorizes forest roads into five maintenance levels, that define the level of service, and maintenance required. Refer to Appendix L, Glossary, for a description of maintenance levels and recommendations. Maintenance level and management opportunities for each road are included in the Appendix A.

Road Maintenance Level 5 (ML5) – roads are managed and maintained for a high degree of user comfort. These roads are generally paved and are suitable for passenger vehicles.

Road Maintenance Level (ML 4) – roads are managed and maintained for a moderate degree of user comfort. These roads are generally aggregate, gravel, or low standard pavement surfaced and suitable for passenger vehicles.

Road Maintenance Level (ML3) – roads are managed and maintained for a moderate degree of user comfort. These are generally aggregate or gravel surfaced roads suitable for passenger vehicles.

Road Maintenance Level 2 (ML2) – roads are managed and maintained for high-clearance vehicle use; passenger car traffic is not recommended.

Road Maintenance Level 1 (ML1) – roads that are closed to vehicular traffic intermittently for periods that exceed 1 year.

Table 1 displays existing maintenance level 1 through 5 system road miles on the Rogue River-Siskiyou NF.

Table 1. Existing road miles by maintenance level on Rogue River-Siskiyou NF (July 2015)

Ranger District	1 - BASIC CUSTODIAL CARE (CLOSED)	2 - HIGH CLEARANCE VEHICLES	3 - SUITABLE FOR PASSENGER CARS	4 - MODERATE DEGREE OF USER COMFORT	5 - HIGH DEGREE OF USER COMFORT	Grand Total
Siskiyou Mountains	84.62	441.12	168.11	6.44	-	700.29
High Cascades	213.18	1309.30	202.38	88.10	-	1812.96
Wild Rivers	216.30	777.51	82.72	43.93	0.95	1121.41
Gold Beach Powers	196.07	948.64	335.87	29.34	38.67	1548.58
Total miles	710.16	3476.57	789.08	167.81	39.62	5183.24

Step 3: Identify Issues

Purpose

The purpose of this step is to:

Identify resource concerns

Identify key issues related to the existing road system

Resource Concerns

Maintenance needs and costs on the Rogue River-Siskiyou National Forest have increased while allocated maintenance funds have remained static or reduced. This has caused a disproportionate shift of maintenance funds to ML 3-5 roads. Increased use coupled with decreased maintenance has resulted in degraded soil, water, vegetation, and wildlife habitat conditions in some areas.

This analysis used the GIS model that was developed for the 2004 Roads Analysis and replicated the analysis using the latest snapshot of the transportation data base and updated protocols to evaluate environmental risks.

The 2004 analysis did not cover all issues and concerns. Additional issues have surfaced since 2004 and additional protocols were developed to adequately display benefits and risks associated with each road segment. Existing plans tiered to with identified road related issues include:

- Siskiyou Land and Resource Management Plan
- Rogue River Land and Resource Management Plan
- Roads Analysis 2004
- Travel Management Supplemental Environmental Impact Statement

Maintenance Level 3-5 roads are generally used by local and out of area visitors in passenger cars. Maintenance Level 2 roads are primarily used by high clearance vehicles and ORVs where permitted. Maintenance Level 1 roads are closed to all motor vehicle use.

Roads and road use effects were identified and evaluated for aquatic and terrestrial wildlife habitat fragmentation, travel corridors, wildlife harassment, disturbance or displacement, habitat loss and reduced productivity, heritage sites, invasive and TES plants.

Public Involvement (Issues)

Public involvement is directed by - 36 CFR 212.5 (B) (1), "In determining the minimum road system, the responsible official must incorporate a science-based roads analysis at the appropriate scale and, to the degree practicable, involve a broad spectrum of interested and affected citizens, other state and federal agencies, and tribal governments."

Public involvement was included to build and strengthen public trust and relationships with communities for road management. Travel analysis is an opportunity for public engagement on transportation planning and management. This TAP document included the social aspects of travel analysis.

The 2004 Roads Analysis documented issues, concerns and values expressed by the public. The analysis identified specific comments related to individual roads considered important to at least some members of the public. Public meetings were held in 2014 to present information on travel

planning, solicit comments and to identify issues for travel planning (Appendix N). Public meetings covered these items:

- Explain the current road system
- Explain Subpart A and B (and C) of the Travel Management Rule and how they relate to each other
- Travel analysis is not a decision process
- Travel analysis will help guide and inform future site specific NEPA and decisions
- Explain roads benefits and risks, both environmental risks and public safety risks
- Protocols and process to be used for travel analysis
- How roads analysis work done in 2004 will be used
- Share information and request input from the public
- Inform the public of the link on our Forest website where an electronic version of the public comment form and other travel analysis information can be found. More details on process, protocols, questions and answer documents, etc. on the website for those who want to get deeper into meeting topics.

Public issues were also identified in the forest plan revision process, travel management subpart B and project level panning. Public scoping related to road and travel management on site specific project areas preceded this analysis. Social and resource issues identified during earlier NEPA project planning were also reviewed and used to evaluate and rate benefits and risks, road management concerns and opportunities.

The Rogue River-Siskiyou Forest Plan web site includes watershed analysis descriptions and issues identified during scoping (http://www.fs.usda.gov/detail/rogue-siskiyou/landmanagement/?cid=stelprdb5315100).

The Rogue River-Siskiyou National Forest, "Roads Analysis", January 2004 Appendix B Public Involvement section is filed at http://www.fs.usda.gov/detail/rogue-siskiyou/landmanagement/?cid=stelprdb5317367 .

The National Forest road system connects to or has jurisdictional overlap with other governments and agencies roads. This report will be available to tribal governments, local county governments including the County Commissioners and County Road and Bridge Superintendents, the Park Service, Bureau of Land Management, and the US Fish and Wildlife Service (R-S NF web site, noted above). Many of these governments and agencies have mutual shared opportunities and issues.

Key Issues

Key issues were identified by Forest resource specialists using public meetings and comments on the Forest Plan revision, Travel Management Subpart B process and on resource specific issues related to activities proposed in NEPA projects. The following road issues were selected and used to evaluate (GIS) and rank road benefits and risks.

Over the years roads and road-related activities have led to many management issues on the Rogue River-Siskiyou National Forest. These issues have been documented in various Project Environmental Analyses, Environmental Impact Statements, Land Management Plans, and other management plans and studies.

Other plans and analyses, which are in process or have been completed, provided additional information to better define benefits and/or environmental risks for specific road segments. Other plans include:

- 2004 Recreation Facility Master Plan
- Siskiyou Mountains Aquatic and Riparian Habitat Enhancement Project
- Applegate-McKee Bridge Watershed Legacy Roads and Trails Project (EA)
- Applegate Plantation Thin (on hold, some analysis completed)
- Bybee Vegetative Management EA
- Sucker Creek Channel and Floodplain Restoration
- Eden Ridge Timber Sales EIS
- Butcherknife/Slate Fuels Reduction Project EA
- Cascades Managed Stands EA
- Big Grayback Range Allotment EA
- East Illinois Valley Managed Stands Project EA
- Plantation Thinning and Fuels Reduction Project on Wild Rivers District (EA)
- Rustler Vegetation Management (EA)
- Wild Rivers Aquatic and Riparian Habitat Enhancement Project (on hold)

Recent documents discussing road issues and concerns include the Applegate-McKee Bridge Watershed Restoration project EA and Travel Management Supplemental EIS.

Key issues include:

- Water quality and erosion
- Botanical areas and special plant habitats
- Public safety
- Motorized opportunities
- Impacts on inventoried roadless areas
- Soils – Site productivity (the effect or motorized use)
- Aquatic conservation strategy (meeting objectives)
- Air quality
    - Emissions
    - Dust and asbestos
- Fire Risk, both suppression and prevention
- Invasive non-native plants
- Invasive pathogens (Port Orford cedar)
- Terrestrial wildlife listed species
- Managed indicator species
- Other special or rare and uncommon terrestrial wildlife
- Fisheries and aquatic species

- Visuals
- Sound levels (noise)
- Concerns about maintaining current access to mining claims
- Cultural resources
- Climate change
- Wild and scenic rivers
- Inadequate road maintenance funding
- Access for administration and fire suppression
- Recreation access
- Vegetation management access
- Private land access
- Product gathering/removal

The intent of this analysis is to identify opportunities to provide and maintain an appropriately-sized and environmentally-sustainable transportation system that is responsive to ecological, economic, and social concerns. Issues and concerns listed above have been incorporated into a process that evaluated and rated each road while comparing access needs with environmental risks.

Issues, concerns, (road risks) and access needs or road benefits were each combined into four groups with a detailed evaluation process described in Step 4.

Step 4: Assess Benefits, Problems and Risks

Purposes

The purpose of Step 4 is to:

- Describe the analysis process
- Describe the criteria used in the risk and benefit analysis process
- Describe scoring and rating
- Summarize the risks and benefits of existing motorized routes
- Discuss the statistical distribution of the risk and benefit assessment
- Describe the costs of maintaining the current road system

The Analysis Process

Issues were identified and assessed in Step 3 by the Interdisciplinary Team (IDT). Benefit and risk criteria categories (Step 4, Table 8) were developed by considering issues from Step 3 and suggested resource questions for roads analysis described in FS-643 Roads Analysis: Informing Decisions about Managing the National Forest Transportation System (RAP) (USDA 1999). The IDT reviewed these resource questions to develop criteria for ranking benefit and risks of each road. Resource benefits and risks were then totaled and summarized for each road (Appendix A spreadsheet).

Step 4 of this Travel Analysis is defining the needs for each road on the forest and the associated risks that the road poses to the environment. This Travel Analysis categorized each road segment using a benefit/risk matrix (Table 8).

Criteria Used for Benefit and Risk Analysis

Roads provide access for management, administration and use of national forest lands. However, their presence has potential negative effects on natural and cultural resources. Resource benefits and risks categories were identified by the IDT to evaluate and identify transportation system management options.

Evaluation Criteria

Road risks and benefits were identified by the team specialists for each resource area. Specialists were tasked to produce a succinct statement describing each issue, and to describe the criteria used to rank the benefit or risk of each road for that issue.

The assigned interdisciplinary team identified the following benefits and risks by resource area standards and guidelines for each road. Table 2 displays issue benefit and risk criteria used to evaluate and rate roads.

Table 2. Resource categories for roads

Benefit **Roads (motorized use) provide these forest management and use benefits:**	**Risk** **Roads and motorized use present risks associated with these resource categories:**
Recreation access	Aquatic environment
Fire management, public safety, egress routes	Terrestrial wildlife
Vegetation management access	Botanical environment
Other access needs (authorized uses)	Forest Plan MAs (LRMP direction)

Each resource specialist developed criteria for rating roads as high, medium, or low benefit or high, medium, or low risk. Resource benefit and risk evaluation process and scoring are described below:

Resource Risks

1. Aquatic Environment

Aquatic environment factors included:

A. Sediment Delivery
B. Roads within Riparian Reserves
C. Fish Passage through Road Crossings
D. Key or Municipal Watershed Status

.

A. Sediment Delivery

The Forest has a complex geologic history. Ancient metamorphosed marine sediments and volcanic igneous rocks of the Klamath geologic province underlie most of the Rogue River-Siskiyou National Forest.

The Klamath province is made up of 'exotic' terrains that were once oceanic crust and volcanic island arcs. The Josephine ophiolite suite represents a layered rock sequence created in oceanic spreading centers near subduction zones. These were carried eastward by the movement of tectonic plates and subjected to extreme pressures as the pieces were accreted under the existing continental edge. The bedrock was then intruded by granitic magmas, adding heat to the intense pressures of the metamorphic process. Faults, shear, and fracture zones are typically areas of concentrated groundwater, more deeply weathered bedrock, and deeper soils. They are often related to the large, ancient, inactive or only periodically active landslide forms.

In the analysis area, one result of these processes can be seen in wide shear zones between different types of rock. These shear zones can be recognized by folds or fractures in the rock, or by bands of serpentine. Faults and shear zones are typically areas of concentrated groundwater, more deeply weathered bedrock, and deeper soils. They are often related to the large, ancient, inactive or only periodically active landslide forms.

Slope stability, erosion and sedimentation are natural and on-going processes that involve both mass-wasting (landslides) and surface erosion. These processes can be influenced and often accelerated by roads. Roads produce fine sediments from both the road surface and entire road prism (cut slopes and fills), and deliver that sediment to drainages through ditches and culverts. The amount of sediment produced is related to factors such as maintenance and traffic levels, road grade and surfacing material as well as soil and parent material. Landslides can be initiated or the failure rate accelerated by road construction, which destabilizes slopes by undercutting and/or loading the slope with fill material.

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

Mid-slope roads divert ground or surface water and concentrate flow to unstable slopes, both natural and engineered, initiating slope and fill failures. Failures at stream crossings often produce debris flows. Debris flows are failures in saturated sediments that scour slopes and stream channels for long distances from the initial landslide. Indirectly, increased rates of sedimentation can change channel morphology and function, for example, by diverting stream flow and undercutting the toe of a landslide deposit, causing stream bank failures downstream. Road networks in watersheds can change the rate of response to rain and snowmelt and alter flow duration and extent. Overland flow occurs whenever rainfall intensity exceeds the infiltration capacity of the soil. In humid, forested landscapes rainfall intensity rarely exceeds infiltration capacity, and overland flow occurs infrequently (except where heavily compacted). In contrast, road surfaces are highly compacted, have high bulk densities, and have little or no pore space. Although roads occupy a very small percentage of most watersheds, they can be responsible for the majority of overland flow in forested basins. Road surfaces can also produce runoff in the majority of storm events.

Studies have shown that interception of subsurface storm flow is responsible for over 90% of the runoff from roads in the Pacific Northwest (LaMarche and Lettenmaier, 2001; Wemple and Jones 2003). Roads with deep road cuts and roads constructed on shallow soils are especially prone to intercepting subsurface storm flow.

An overall measure of the impacts of the road network to a watershed is the road density within the watershed.

Roads adjacent to or within Riparian Reserves may retard or prevent attainment of Aquatic Conservation Strategy (ASC) objectives developed as part of the Northwest Forest Plan (1994). Riparian Reserves include lands along all streams, lakes, ponds, wetlands, unstable areas, and potentially unstable areas that are subject to special Standards and Guidelines designed to conserve aquatic and riparian-dependent species.

The road system may directly affect large wood and sediment delivery processes, and alter fish habitat, fish migration patterns, and aquatic habitat conditions. Roads and stream crossings may change the mechanism by which wood and sediment reach streams, and change fish migration patterns. Roads paralleling or bisecting stream channels and adjacent riparian zones occupy space where vegetation once grew, and increase the likelihood of increased sediment delivery to stream channels. For this analysis the width of the impact zone of a single lane road is estimated to be 100 feet and of a double lane road 160 feet. Most large wood is delivered to the stream network by directly falling in to a stream channel, debris flow degradation down channels, or by transport along with sediment by a landslide.

The contribution zone for trees is principally within one site tree height of a stream channel, or from an area prone to instability that delivers large wood to a stream channel (one tree height is defined as 150 feet) The contribution zone is double this distance along fish bearing streams. In a forested environment, large wood delivered by tributary channel transport, direct entry from riparian zones, and side-slope landslides, influences fish habitat. The large wood begins to sort diverse stream substrate sizes, creates habitat units (pools, riffles), forms depositional bars, builds floodplains with diverse topography, and causes other influences on aquatic and riparian habitat. Sediment delivery from roads usually contains little or no wood.

The loss of stream channel roughness and the increase in fine and coarse sediment will simplify aquatic insect and fish habitat, cause channel widening, and have other negative influences on aquatic habitat.

Cumulative effects and exponential increases in sediment delivery can occur where roads impact a single stream channel in several locations along the stream profile. The aquatic risk to watersheds within the analysis area was rated. Stream miles in the watershed were divided by the miles of road within one site tree height. Stream crossings per mile of stream channel were also used to rate the risk of roads within the watershed.

The streams used for this broad-scale analysis are in the GIS system "Stream Class" file, as perennial streams, and a small percentage of intermittent streams.

Sediment Delivery; the rating system used to assess the environmental risk of excess sediment entering the stream system is based on five separate GIS analyses. Two of these analyses assign values to roads and three assign values to the impacted watershed. The highest value for each road is then combined with the highest value assigned to the impacted watershed in a matrix that assigns the final sedimentation delivery cost associated with that road.

Riparian reserves (150 feet or 300 feet if fish bearing) contributions to sediment impacts.

Sub-watershed ratings (Percent of the total stream riparian area in the watershed that is displaced by the area occupied by roads):
(Low: <7%), (Moderate: 7% to 15%), (High: >15%)

Stream Crossings Frequency Individual Road Segment Rating (stream crossings per mile):

(Low: <1), (Moderate: 1 to 3), (High: >3)

Sub-watershed rating (average number of road crossings per mile of stream within the watershed)
(Low: <0.5), (Moderate: 1 to 3), (High: >3)

Road Density (miles/square mile) within the Sub-watershed
Sub-watershed rating:
(Low: <1.5), (Moderate: 0.5 to 1.0), (High: >1.0)

Erosion Potential; The rating system used to measure the environmental cost of erosion potential was done using existing information, with limited field verification. A soil erosion layer in GIS was used to determine areas of severe erosion potential. The Erosion Potential mapping used for the analysis is based on generalized descriptions and groupings of soil complexes and parent material. Information used includes landslide potential, soil stability, and geological hazard mapping. The maps and reports derived from the analysis are useful for broad comparisons of erosion potential between watersheds and for hazard assessment, but not for site-specific planning. Individual soil polygons, geologic maps, and field verification of rock and soil type are necessary to assign stability and erosion potential at the project planning scale. Information used included geo databases for erosion potential, landslide potential, and geological hazards.

Erosion Potential Rating

Individual road segments rating (% of the road segment located within areas of high erosion, landslide potential or geological hazard risk):
(Low: <5%), (Moderate: 5% to 10%), (High: >10%)

Sub-watershed rating (50% is based on percentage of road miles within areas with high erosion, landslide potential, or geological hazard risk and 50% based on the percentage of the watershed that includes these areas).

The final sediment delivery impact value assigned to each road is calculated using a matrix that takes into account the direct impacts of each road and the combined impacts of all roads in a particular watershed (Appendix A and K).

B. Roads within Riparian Reserves

Road construction, operation and maintenance in and adjacent to riparian areas can cause negative impacts to riparian area processes, structures, and functions. Impacts can include erosion and deposition, sedimentation, decrease in stream shade, invasion of exotic species, decreased diversity of native species, alterations to the precipitation-runoff relationship, habitat fragmentation, potential contamination from hazardous spills and perhaps most importantly alterations to organic debris, especially large wood.

Large wood is an integral part of many stream ecosystems in the Pacific Northwest. A wide variety of organisms have life histories associated with wood located in the active channel. It is a substrate for photosynthetic organisms such as green algae, cyanobacteria, diatoms, liverworts, mosses, and trees (Harmon and others 1986). Large woody debris jams often create low velocity lateral habitats, which provide resources and refugia for juvenile fish (Moore and Gregory 1989).

Streams with large pieces of wood in the active channel better retain dissolved and particulate carbon than those without large wood (Bilby 1981, Bilby and Likens 1980). In addition to the chemical and biological interactions mentioned above, large wood is a key factor in determining the geomorphic response of a stream to the physical disturbances that shape the channel. There is a positive relationship between pool volume and the amount of large wood in the channel (Carlson and others 1990). Energy dissipation of stream flow caused by the presence of wood dams causes the formation of upstream gravel bars (Lisle 1986). Most large wood delivered to streams originates in the streamside vegetation.

For the Riparian Reserve factor, as with the Sediment Delivery factor, the portion of each road segment that is within one site tree height (150 feet) of the stream was calculated using the Geographical Information System (GIS).

Riparian Reserve

Individual road segments rating (% of the road segment located within one site tree height or 300 feet for fish streams):
(Low: <10%), (Moderate: 10% to 40%), (High: >40%)

C. Fish Passage through Road Crossings

Fish passage and migration are affected by stream crossing structures in the road system. Bridges and natural bottom structures have little or no effect on the migration of fish upstream and downstream, however culverts or other structures used to support the road facility over the stream can interrupt fish movement in a watershed by introducing prohibitive jump heights into the pipe, long swimming distances without adequate light, and water velocities within the pipe that are too high for fish to successfully swim. These situations present impediments to juvenile and adult migrating fish moving upstream.

Connectivity of aquatic habitat is paramount for fish to retain the ability to migrate to: stream habitat with more favorable spawning conditions, areas with optimum water temperatures, and stream reaches with preferred aquatic habitat features, (e.g. deep pools and adequate hiding cover).

Listed and sensitive fish species are fish species of concern that are listed under the Endangered Species Act (ESA) or identified on the Pacific Northwest Region (Region 6) Sensitive Species List. Coho salmon (Oncorhynchus kisutch) and occupied and historic Coho salmon habitat (Critical Habitat) are listed as threatened under the ESA.

Coastal cutthroat trout (Oncorhynchus clarki), Chinook salmon (Oncorhynchus tshawytscha) and steelhead trout (Oncorhynchus mykiss) are on the Region 6, Regional Forester's Sensitive Species List. Within this analysis, all road crossings on fish-bearing streams will affect a listed or sensitive fish species because cutthroat trout generally occupy the uppermost stream habitats in the Siskiyou Area.

Fish passage

Individual road segments rating (road crossings per mile of road in fish bearing streams):
(Low: <1), (Moderate: 1 to 2), (High: >2)

D. Key or Municipal Watershed

The Key Watershed designation is part of the Aquatic Conservation Strategy in the Northwest Forest Plan (NWFP). These watersheds or watersheds were designated by scientists as core areas of aquatic/riparian habitat integral to recovering depressed anadromous fish populations.

The road system within a Key Watershed is of special concern. Within the Aquatic Conservation Strategy of the Northwest Forest Plan, there is a guideline for no net increase in the total miles of road inside these watersheds, with an emphasis placed on reducing the miles of road in areas with high erosion and high sediment delivery potential.

Four Key Watersheds are designated on the Siskiyou Ranger District. They are identified as: Beaver Creek, Palmer Creek, Upper Little Applegate River and Yale Creek. The Ashland Creek Watershed is a municipal watershed for the City of Ashland.

There are two designated Key Watersheds on the Cascade Ranger District: Elk and Little Butte Creek Watersheds. The Big Butte Springs Watershed is a municipal watershed for the City of Medford Water Commission.

The Wild Rivers Ranger District has six key watersheds: Sucker Creek, Silver Creek, Indigo Creek, East Fork Illinois River, North Fork Smith River and Taylor Creek. Briggs Creek was identified as a high priority watershed for restoration by a Forest team in addition to some of the key watersheds above. Briggs Creek will be given equal emphasis and scoring for this analysis with the other key watersheds.

Twelve Key Watersheds are designated within the Pacific-Powers Roads Analysis Area. They are identified as: Elk River, South Fork Coquille River, Shasta Costa Creek, Indigo Creek, Silver Creek, Lawson Creek, Quosatana Creek, North Fork Chetco River, Emily Creek, Winchuck River, and the North Fork Smith River.

South Fork Lobster Creek Watershed is identified by the Oregon Department of Fish and Wildlife and the Forest Service as crucial to anadromous fish production in the Lower Rogue sub-basin. Therefore, for the sake of this analysis, South Fork Lobster Creek Watershed is rated "high" even though it is not a Key Watershed.

Key Watershed

Sub-watershed rating (within a Key Watershed, or Ashland Creek Municipal Watershed)
(High – if it is within the watershed)

There is no "Low or Moderate" rating for this factor, roads not rated high risk were given a low rating.

2. Terrestrial Wildlife

The factors identified as wildlife environmental costs within the Siskiyou Roads Analysis area are:

A. Late Successional Fragmentation
B. Travel Corridors
C. Threatened, Endangered and Sensitive Species
D. Wildlife Harassment

These factors describe where and how the road system may directly affect wildlife and wildlife habitat.

A. Late Successional Fragmentation

Over 1,100 terrestrial species have been determined to be closely associated with late successional and old growth forests, including the northern spotted owl, red tree vole, bats, salamanders, and numerous mollusk and botanical species. These natural populations are affected by habitat fragmentation caused by the presence of roads, which change the landscape structure. Roads fragment habitat by dissecting vegetation patches and increasing the edge-affected area, thereby decreasing interior habitat. Forest fragmentation eliminates blocks of continuous habitat, or degrades the quality of remaining habitat for those species sensitive to an increase in the amount of forest edge. During the daytime, forest edges typically have lower humidity, higher air temperatures, higher soil temperatures and lower soil moisture, increased solar radiation, and higher wind speeds than interior forests. Edge-affects manifest themselves in several ways. Birds' nests show an increase of parasites and nest depredation. Amphibian distributions change, as well as plant distributions and abundance. Noise from vehicle traffic degrades habitat for birds, and big game such as deer and elk. Snag removal along Forest Service roads to ensure safety for the public and employees has an effect on bats and cavity nester species that require dead trees for forage and nesting.

Physical edge effects from general forest roads commonly extend up to 120 meters (131.2 yards). To rate the fragmentation effects, Mature Habitat and Old Growth stands (Data acquired from satellite GNN imagery) were intersected with the road layer. The impact that the road has is determined by the percentage of the road that passes through these stands.

Fragmentation

Individual road segments rating:
No significant impact – less than 10% of the road falls within the GIS defined stand
Low – More than 10% to 25% of its length fall within stands
Moderate – 25% to 50%
High – Greater than 50%

B. Travel Corridors

Riparian Reserves serve as key travel corridors for many species because the three essential survival elements are found there: food, shelter, and water. The riparian corridors are generally intact, and offer continuous canopy cover which moderates the extremes in conditions found outside the reserves.

Riparian Reserves are viewed as reservoirs of the natural environment branching through stands of managed forests. This connected habitat between late successional stands is used to travel to and from summer and winter ranges, and between feeding, breeding, brooding, and rearing habitats. Intersection of reserves by

roads dissects the travel corridors and may have adverse effects on many species. As deer and elk migrate from their summer range to the wintering grounds, well-defined migration trails intersect forest roads, and increased road kills occur. Small, slowly moving migratory animals such as amphibians are highly vulnerable as they cross even narrow forest roads.

Birds are attracted to roads to hunt for small mammals, or to feed on grains and seeds along roadsides, resulting in mortality from vehicle collisions. Reptiles seek roads for thermal cooling and heating, which also increases mortality rate from vehicles. Forest carnivores such as coyote, bobcat and cougar, are vulnerable to road mortality because they have large home ranges that often include road crossings. Many species avoid roads. When this happens, animals remain at some distance from roads and rarely or never attempt to cross.

The roads then become barriers to movement causing the fragment of large continuous populations in to smaller subpopulations. When populations become subdivided, there is increased risk of demographic fluctuation, local extinction of subpopulations, less re- colonization after local extinction, and a progressive loss of local biodiversity. As road width and traffic density increase, roads become more effective barriers. This factor intersected the road layer with the Riparian Reserve layer.

Travel Corridor

Individual road segments rating:
Low – Road segment did not enter the Riparian Reserve
Moderate – Road segment ran parallel to a stream within the Riparian Reserve, but did not cross the stream
High – Road segment dissected the Riparian Reserve and crossed the stream, fragmenting the travel corridor.

C. Threatened, Endangered and Sensitive Species

Peregrine falcons, marbled murrelets, northern spotted owls, and bald eagles can be negatively affected by disturbance due to road presence, especially during the critical nesting periods.

Peregrine falcons are particularly sensitive to their surroundings during the nesting season, and due to disturbance, they will sometimes abandon the nest (eggs or young). Disturbance can allow predator access to a nest, with a resultant nest failure. Within the typical 3 mile-radius protection zones for peregrine nests, management activities within ½ mile of the nest site have the highest potential to disturb peregrines. Northern spotted owls may be disturbed from activities on roads within ¼ mile of nest sites. Bald eagles may be impacted by road activities within ½ mile of an active nest site.

The following rates impacts to peregrine falcon, northern spotted owl, and bald eagles from habitat that may be associated with disturbance due to road presence. Roads not given a high or moderate rating were rated low.

> Peregrine Falcon: The road layer was intersected with the primary, secondary, and tertiary nest protection zones.
> Individual road rating:
> Moderate - Road segment fell within the secondary nest protection zone (>0.5 to 1.5 miles radius)
> High - Road segment fell within or was used as the boundary of the primary nest protection zone (0.0 to .05 miles radius from the nest site)
>
> Northern spotted owl and marbled murrelets: distance from activity center
> Individual road rating:
> (Moderate: 0.125 mile to 0.25 mile) (High < 0.125 mile)

Bald Eagle: distance from nest site
Individual road rating:
(High < 0.5 mile)

D. Wildlife Harassment

Big game species such as deer and elk as well as many other species are sensitive to harassment or human presence, which is facilitated when roads are introduced in to a closed forest environment. Reductions in productivity, increases in energy expenditures, and displacements in population distribution or habitat use can occur. An example is avoidance by elk of large areas near roads open to traffic, with avoidance increasing as rate of traffic increases. Increases of energy expenditures in late fall and winter can lead to potential reductions in productivity. Also, a higher density of open roads correlates with an increased level of poaching activity. Thus, open road density including open state and county roads, but not private roads, in big game wintering grounds is a direct effect on big game populations.

Open road density may directly impact many animal species besides big game. Birds are attracted to roads to hunt for small mammals, or to feed on grains and seeds along roadsides, resulting in mortality from vehicle collisions. Reptiles seek roads for thermal cooling and heating, which also increases mortality rate from vehicles. Forest carnivores such as coyote, bobcat and cougar, are vulnerable to road mortality because they have large home ranges that often include road crossings.

Many species avoid roads. When this happens, animals remain at some distance from roads and rarely or never attempt to cross. For example, species such as fisher will avoid entering open areas like roads.

Standards and Guidelines from the RRNF Forest Plan, limiting the number of open roads to approximately 1.5 miles per square mile of land, were used to determine wildlife harassment costs (LRMP 4-178 – November 1 to April 30 – Big Game Winter Range). This 1.5-mile threshold was applied by intersecting a Section grid (Township/Range) with the road layer across all land allocations, to represent the effects of road density on wildlife in general.

Wildlife Harassment: open road density (miles/square mile) within the Sub-watershed

Sub-watershed rating:
(Low: <1.5 or 10%-25% passes through BGWR)
(Moderate: 1.5 to 3.0% or 25% - 40% passes through BGWR)
(High: >3.0% or >40% passes through BGWR)

Terrestrial Risk Summary Score: For each of the four factors analyzed for terrestrial risk each road was given a value of 1, 2 or 3 (low, moderate, or high). The cumulative value for each road ranged from 0 for no affect to a high of 11 for the most affect. Roads with a cumulative score of 1-4 then got an overall rating of low, 5-7 an overall rating of moderate, and 8-11 an overall rating of high.

3. Botanical Environment

The factors identified as Botanical environment costs within the Rogue River-Siskiyou Roads Analysis area are:

A. Botanical resource viability
B. Invasive Plant Management
C. Invasive Pathogens

A. Botanical Resource Viability

Botanical resources on the Siskiyou Mountains Ranger District (and other ranger districts) that could benefit from closing roads are:

- roadside rare plant populations whose viability may be at risk due to human activities associated with keeping a road open (such as road and ditch maintenance)
- rare plant populations whose viability may be at risk due to public use of a road (such as increased potential for illegal off-road OHV damage to populations or habitat)
- roadside rare plant populations whose habitat quality would improve if a currently-open road were closed (such as a species which prefers a closed canopy)
- botanical areas and research natural areas whose desirable natural features could be negatively affected by human activities which roads make possible, or more likely to occur (such as ground disturbance caused by heavy recreation use)
- unique native plant communities whose unique features could be negatively affected by the presence of a road, road maintenance activities, or human activities which roads make possible, or more likely to occur (such as alteration of a hydrologic regime by ditching, or increased potential for illegal off-road OHV damage).

There are no GIS attributes currently available that would allow modeling to identify situations where the above botanical resources would benefit from closing specific roads. However, the Forest botanist and Ranger District botanist used maps, local knowledge, and current GIS layers to identify the following roads which, if closed, could provide some benefit to one or more of the botanical resources listed above: See Appendix A and K – Botanical Concerns for a complete list of identified roads.

There are some sun-loving or disturbance-loving rare plant species on the forest that benefit from the openings created by some current open roads, or benefit from periodic roadside disturbance. Roadside occurrences of these species could shrink or disappear over time if the roads are closed, become undisturbed, and/or a tree canopy gradually grows in. The Forest and Ranger District botanists have determined that none of these species would be threatened by closing roads at any rate envisioned for the next several decades, to the point that their district-wide viability would become at risk. At this time, no listing of roads is provided that, if kept open, would benefit these sun-loving and/or disturbance-loving rare plant species.

Botanical Resource Viability

If road segment is listed: Individual road segments rating: (High)

B. Invasive Plant Management

Non-native invasive plants are present on many parts of the Forest, particularly along roads. The Forest has an active prevention and control program for the worst of these invaders which are Oregon Department of Agriculture (ODA)-designated Noxious Weeds. Primary vectors for noxious weeds are mostly people, vehicles, machinery, imported rock and fill. The vector for one species, the non-native houndstongue, is animal fur/hair/hides, and for another, bull thistle, it is wind. Invasive plants are sometimes inadvertently included in seed mixes. Disturbance (fire, logging, grazing, soil displacement, etc.) increase the likelihood that these invaders will establish and spread once their propagules are present. Road maintenance activities have the potential to spread invasive plants along roads.

Although both our roads and our known noxious weed locations are available as GIS layers, there does not seem to be a practical way to use modeling to identify roads which, if closed, would likely enhance our ability to manage invasive plants (We have noxious weeds along a large number of roads on the Forest). The

Forest botanist and Ranger District botanist used maps, local knowledge, and current GIS layers to identify roads that, if closed, could provide some net benefit to conduct effective invasive plant management.

The Forest and Ranger District botanists point out that vehicle access provided by some open roads to treat distant known noxious weed infestations can be an asset to our noxious weed control efforts and monitoring. No effort has been made to list the specific open roads which currently allow easy access to known noxious weed infestations. However the number of situations where this does occur is considerable. And this desire for ease-of-access-to-treat-and monitor kept some roads off the listing above.

Invasive Plant Management

Individual road segments rating: (High, Moderate, or Low based on evaluation by Forest and District Botanists)

C. Invasive Pathogens

Phytophthora (meaning "plant destroyer") is a genus of more than 70 described species of the Oomycetes. Often referred to as "fungi", Phytophthora species are "water molds" that are more closely related to marine algae than fungi. Favored by moist conditions, Phytophthora species include some of the world's most notorious plant pathogens. Two non-native invasive pathogens, Phytophthora lateralis, the cause of Port-Orford cedar root disease and occasionally infecting the Pacific yew, and Phytophthora ramorum, the cause of Sudden Oak Death or Ramorum leaf and twig blight, are known to occur on the Rogue River-Siskiyou National Forest. While these two pathogens have slightly different life histories, their spread may be influenced by human activities:

Phytophthora Lateralis (PL) is a virulent, non-native root pathogen. It was introduced into the native range of POC in the early 1950s and its place of origin is unknown. It readily kills POC of all ages that are growing on sites favorable for infection. Once an area becomes infested, it is difficult to eradicate PL. The Powers Ranger District has the greatest concentration of POC in the world. POC also occurs on the Gold Beach and Wild Rivers Districts. There are no Port-Orford cedar stands on the Siskiyou Mountains or High Cascades Districts.

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

There are currently 144 7th field watersheds on the Rogue River-Siskiyou National Forest that are designated as "Un-infested 7th field watersheds". These watersheds are considered critical habitat to protect from infestation. An integrated treatment program for these watersheds has been implemented. Select roads are closed with a gate during wet conditions in order to reduce the risk of contamination by Phytophthora lateralis. Most of the gated roads are closed seasonally, usually from October to May. A few of the roads are in a different status that can range from closed year-round indefinitely or for a period of three years (i.e., road 4201142) to currently open, or open as needed. A road with a closed gate cannot be legitimately entered unless the party has a permit or other authorization from the Two Rivers District Ranger. This is a mandatory requirement for miners, private land owners, contractors, recreationists lodging overnight at a lookout, and other road users, including Forest Service employees seeking access for administrative purposes. A combination of sanitation treatments are used including vehicle washing, road drainage improvements,

timing of activities during dry seasons and using certified clean or Clorox bleach-treated water for firefighting, road grading and other activities. The Forest also regulates special use activities such as cedar bough collecting, and promotes public education.

Phytophthora ramorum (PR) is well adapted to the mild, wet conditions of the Pacific Coast. The pathogen produces small sacs of swimming spores that readily break off and can be spread in rain splash and wind. Multiple generations of spores may be produced during wet weather periods at any time of year. The pathogen spreads from tree to tree as zoospores or sporangia in water: rain splash, drip and stem flow. Longer distance spread in forests is facilitated by turbulent transfer of sporangia dislodged from upper crown infections in clouds and wind-driven rain. It can be picked up and carried via soil adhering to hikers' shoes and on mountain bike tires. However, since treatment and eradication of an infected area occurs immediately after discovery, and all infested sites on the Forest have been treated.

An interagency Port-Orford-cedar Supplemental EIS team consisting of BLM and Forest Service employees is currently working on a supplemental EIS titled "*Management of Port- Orford-Cedar in Southwest Oregon*". The Proposed Action incorporates direction for more road closures and greater use of specific road maintenance practices to reduce the risk of contamination by *Phytophthora lateralis.* [Reference: *Management of Port-Orford-Cedar in Southwest Oregon*, *Draft Supplemental Environmental Impact Statement, Coos Bay, Medford, and Roseburg Bureau of Land Management Districts and the Siskiyou National Forest in Southwest Oregon, June 2003*].

Port-Orford-Cedar Disease (Phytophthora lateralis):
Individual road segments rating:
Road is within a designated watershed (High)
Road connects an infested watershed with a designated watershed (Moderate)
Other roads are rated low

4. Management Areas

A. Wild and Scenic Rivers
B. Inventoried Roadless Areas
C. Cultural Resource Protection

A. Wild and Scenic Rivers

Congress passed the Wild and Scenic River Act on October 2, 1968. Under this Act selected rivers in the United States are preserved for possessing outstandingly remarkable scenic, recreational, geologic, fish and wildlife, historic, cultural, or other similar values. Rivers or sections of rivers, so designated are preserved in their free-flowing condition and are not dammed or otherwise impeded. National wild and scenic designation essentially vetoes the licensing of new hydropower projects on or directly affecting the river. It also provides very strong protection against bank and channel alterations that adversely affect river values, protects riverfront public lands from oil, gas and mineral development, and creates a federal reserved water right to protect flow-dependent values. For federally administered rivers, the designated boundaries generally average one-quarter mile on either bank.

Rivers are classified as wild, scenic, or recreational.

Wild River Areas – Those rivers or sections of rivers that are free of impoundments and generally inaccessible except by trail, with watersheds or shorelines essentially primitive and waters unpolluted. These represent vestiges of primitive America.

Scenic River Areas – Those rivers or sections of rivers that are free of impoundments, with shorelines or watersheds still largely primitive and shorelines largely undeveloped, but accessible in places by roads.

Recreational River Areas – Those rivers or sections of rivers that are readily accessible by road or railroad, that may have some development along their shorelines, and that may have undergone some impoundment or diversion in the past.

A Wild & Scenic designation:

- Protects a river's "outstandingly remarkable" values and free-flowing character
- Protects existing uses of the river
- Prohibits federally-licensed dams, and any other federally-assisted water resource project if the project would negatively impact the river's outstanding values
- Establishes a quarter-mile protected corridor on both sides of the river
- Requires the creation of a cooperative river management plan that addresses resource protection, development of lands and facilities, user capacities, etc.

Roads within the boundaries of a Wild and Scenic River can have an impact on the river's free-flowing condition, water quality, or outstanding resource values. Roads can also provide access for recreation, agricultural practices, private lands and other uses allowed or encouraged, most notably in designated Recreation River areas.

Wild and Scenic River rating:

Individual Road Rating:
Wild (High), Scenic (Moderate), Recreation (Low)

B. Inventoried Roadless Areas

The 2001 Roadless Rule establishes prohibitions on road construction, road reconstruction, and timber harvesting on inventoried roadless areas on National Forest System lands. The intent of the 2001 Roadless Rule is to provide lasting protection for inventoried roadless areas within the National Forest System in the context of multiple-use management.

Inventoried roadless areas provide water and function as biological strongholds for populations of threatened and endangered species. They provide large, relatively undisturbed landscapes that are important to biological diversity and long-term survival of at risk species. Inventoried roadless areas provide opportunities for dispersed outdoor recreation, opportunities that diminish as open space and natural settings are developed elsewhere. They also serve as bulwarks against the spread of non-native invasive plant species and provide reference areas for study and research.

Although the 2001 Roadless Rule does not close nor recommend decommissioning existing roads in Roadless Areas, it does describe impacts that these roads can have on the social and ecological values and characteristics that these areas provide. It recognizes the wide range of multiple uses that existing roads do have. Benefits of individual roads within Inventories Roadless Areas are evaluated for road benefits. Under this section those same roads are recognized as having a detrimental effect on the inventoried roadless area.

Inventoried Roadless Area

Individual Road Rating:
(High) Road penetrates the boundary by more than 1/8th mile.

Note: Often, roadless areas boundaries follow a road alignment. The GIS system does not recognize that these boundaries are concurrent and often indicate that a road is penetrating the roadless areas when in fact it is not, thus requiring the GIS model to use the 1/8th mile standard.

C. Cultural Resource protection

The general public and Tribes have been collecting and harvesting forest resources for decades, in some cases, centuries. During the 20th century a large network of roads were created to access, harvest and transport timber. Road construction, use, and maintenance may cause adverse impacts to cultural resources. Roads may damage or completely destroy site features and cultural materials by the excavation or grading away of soil material. Motorized use within and on travel routes can directly impact archaeological sites by displacing soil and rutting that causes alteration and damage to the artifacts and features; by removing or changing the context of cultural materials; and breakage and damage of artifacts from crushing. Potential for these impacts to occur increases depending on the site type, soils, and season of travel (wet verses dry). Sites located adjacent to roads may be impacted by increased and/or diverted surface water from roads that result in removal of soil and loss of ground cover causing increased sheet wash and water channeling that exposes buried cultural deposits, washed away or displaced artifacts, and destroyed features. Sites located on non-sensitive soils are less likely to be affected from erosion resulting from roads. Sites that are more visible because of minimal surface vegetation or loss of surface vegetation are more likely to be looted.

While the construction and use of roads (both official and user created) in and near sites have directly affected sites, the presence of roads in and near sites also can indirectly and directly affect site condition as well. The most important of these impacts is intentional vandalism (looting). Looting and vandalism of sites on public lands is a problem throughout the United States. Some of these activities are conducted for recreation and others for illegal gain. When a site is looted significant contextual information and parts of our history are stolen and destroyed. As transportation technology has advanced (i.e. four wheel drive) a greater number of roads have provided access to remote areas. Ease of access to sites creates conditions where individuals can pick up artifacts on the ground surface, dig for artifacts below surface, and intentionally deface or destroy features and structures. Roads may provide access to remote sites and looters a convenient method to easily transport heavy, awkward or delicate archaeological items and/or larger quantities of those items that previously would have been difficult to remove from the backcountry.

Studies conducted in the late 1970's and early 1980's on the behavior and impacts by looters documented that these individuals prefer visually obvious sites that are accessible by maintained roads, within a driving distance of 1-20 miles from a community, and do not require walking more than a few hundred yards (Nickens, Larralde and Tucker 1981). Lightfoot (1978) found there is a correlation between the amount of illegal surface collecting of artifacts from sites and the distance and visibility of the site from a road. Studies by Francis (1978:130) determined that the degree of casual collection appears to be the most severe on sites that are located within 150m (492ft) of unimproved roads such as 4-wheel drive jeep trails.

The factors identified that have an effect on cultural resources within the Siskiyou Mountains Roads Analysis area are:

Roads and Erosion: Direct and indirect impacts (erosion) that affect National Register eligible or unevaluated cultural resources caused from construction, use, and presence of the road. The road impacts and the associated potential erosion impacts are determined by the number of archaeological sites that the road directly bisects and the number of known archaeological sites within a distance of 100 feet of the road.

No known impacts = 0 sites
Low = 1-3 sites
Medium = 4-7 sites

High = 8 or more sites

Vandalism: Current evidence or increased risk of vandalism (intentional and inadvertent) and/or looting to archaeological sites from road access. The impact that the road has is determined by the presence of vandalism and/or looting of archaeological site/s along the road; or determined by the increased risk for vandalism and looting by the number of known archaeological sites that are within a distance of 500ft of a motorized system road or trail route.

No known Impact = 0 sites are known to be present
Low = presence of 1-4 sites / or evidence of vandalism and/or looting at 1 site
Medium = presence of 5-7 sites / or evidence of vandalism and/or looting at 2 sites
High = presence of 8 or more sites / or evidence of vandalism and/or looting at 3 or more sites

Traditional Cultural Site protection: Access and use of roads that affect Tribal traditional and religious areas (traditional cultural properties) and sacred places. American Indian access and use of traditional cultural properties and sacred sites:

Low = No known TCP or sacred sites are within 660ft of a system road or trail
High = Presence of known TCP or sacred site within 660ft of a system road or trail; and/or a Federally recognized Tribe associated with the lands of the Rogue River-Siskiyou NF has specifically identified that the motorized route affects* access and use of a TCP and/or sacred site. Affect may be beneficial or adverse depending on the Tribe's traditions and method of access.

Road Benefits, Access Needs

1. Recreation
2. Fire Protection and Suppression
3. Vegetation Management
4. Access Needs, Authorized Uses

1. Recreation

Access to recreation sites is a critical component in providing a "quality" recreation experience for forest visitors. This analysis addresses recreation based on roads that access developed recreation sites, trailheads, dispersed recreation sites, and other opportunities as described below.

A. Developed Recreation Sites
B. Developed and undeveloped Trailheads
C. Dispersed Recreation Sites
D. Other Recreation Opportunities

A. Developed Recreation Sites

The Forest Service continues to place a high priority on providing quality recreation opportunities. However, the demand for recreational opportunities on National Forests far exceeds the ability of the Forest Service to provide those opportunities. Nationally, annual appropriations have been flat. Increasing fixed costs reduce the amount of money available to fund recreation programs, intensifying the need to direct funds to highest priority sites. As demographics change and new challenges are presented, it is our responsibility to respond and ensure the appropriate recreation services and facilities are available to the public.

The Forest Recreation Program can no longer attempt to provide everything to everyone and so it will become more focused on what people typically come to the Rogue River-Siskiyou NF to experience.

Recreational activities occur on the Forest year round and encompass a wide variety of activities including camping, hiking, fishing, whitewater rafting, snowmobiling, cross-country skiing, snow play, mountain biking, hiking, horseback riding, and hunting.

To address these concerns, the Rogue River-Siskiyou National Forest (Forest) completed a Recreation Facility Analysis (RFA) process to help provide the best recreation opportunities in the right places.

The RFA process involved several steps: gathering inventory and financial data; identifying the Forest recreation niche; evaluating each developed recreation site against established national criteria (including conformance with the Forest niche, financial efficiency, and environmental and community sustainability); and ranking the recreation sites according to those Criteria. Ranking values for the entire Forest ranged from a low of 0 to a high of 93. The Upper third of all developed sites ranged from 69 to 93, the middle third from 59 to 68 and the bottom third from 0 to 59.

The Forest's goal is to ensure future recreation opportunities meet what people want and how they use the land.

A developed recreation site is one that contains facilities (toilets, tables, etc.), and in turn, results in the concentrated use of an area.

Additional description of developed sites and their ranking are included in Appendix K

Developed recreation sites

Individual Road Segment Rating (Recreation Facility Master Plan sites ranking):

High – Roads accessing site in top third tier
Moderate – Roads accessing site in middle tier site
Low – Roads accessing site in lower third tier

B. Trailheads

A trailhead is a facility designed primarily for parking and provides access to a trail for purposes of travel by foot, horseback, mountain bike, or motorized trail vehicle (less than 50" in width). Nine (9) developed trailheads were identified in the Recreation Facility Master Plan. However there are numerous other trailheads and trail-road crossings that provide access to trails. These intersections normally have parking for one or more vehicles, mostly created by users, but usually maintained during road maintenance activities.

Trailheads

Individual Road Segment Rating:

High – Roads accessing RFMP site in top third tier.
Moderate – Roads accessing RFMP site in middle tier site and roads accessing the Pacific Crest Trail and roads accessing more than one undeveloped trail crossings.
Low – Roads accessing RFMP site in lower third tier and roads accessing one undeveloped trail crossing.

C. Dispersed Recreation Sites

A dispersed recreation site is one found within the general forest area and does not have any facilities associated with it. There are numerous dispersed recreation sites on the Forest. Some are more well-known and used than others. These sites include traditional vehicle camping sites, and named features that are significant points of interest like falls, springs, or rock outcroppings. On the Siskiyou District dispersed campsites are only allowed on Maintenance Level 2 and 3 roads (Travel Management EIS).

Dispersed Recreation Sites

Individual Road Segment Rating: Road accesses:

(High – Campgrounds converted to dispersed sites, high use sites such as river corridors or road accesses more than 7 sites), (Moderate accesses 4-7 sites), and (Low accesses 1-3 sites)

D. Other Recreation Opportunities

Roads provide other recreation opportunities such as driving for pleasure and viewing scenery, mountain biking, OHV access, and winter recreation for Nordic skiing and snowmobiling. There are the Rogue-Coquille Scenic Byway, three undesignated scenic loops, two informal snowmobile routes, the Wild River Coast Scenic Bikeway (Elk River Road), two mountain bike routes, and two OHV routes. Dutchman Peak lookout and access to the Mount Ashland Campground on the Klamath National Forest are also important sites.

Scenic loops include the Siskiyou Crest Route (FDR 2000), which straddles the Siskiyou Crest and is located on both the Rogue River N.F. and the Klamath N.F. (FDR 2000 also provides access to two developed recreation sites located on the south side of Mt. Ashland in the Klamath N.F.); the Upper Applegate/Thompson Creek Route (FDR 10), which follows Upper Applegate River, Carberry Creek, and Thompson Creek; and Whisky Peak/Low Gap Routes (FDR's 1035, 1040, 1030, and 1030400), which access Whisky Peak and Low Gap.

Heritage resources are the physical remains of sites, structures and districts that reflect historic or prehistoric use of forest resources on lands now designated as National Forests. These sites are evaluated using National Historic Preservation Act criteria and sites with significant properties are nominated to the National Register of Historic Places. Forest Plan direction requires that these eligible sites be maintained and adverse effects mitigated. Heritage sites not included in this analysis are those accessed solely by trail. The degree of benefit to these sites provided by roads is based on level of demand to access these sites:

Other Recreation Opportunities

High – Roads identified above and roads accessing heritage sites of interest.

Other roads are rated low

2. Fire Protection and Suppression

This issue has two parts. The first concerns the potential for various forms of motorized travel that would increase the risk of unplanned fire ignitions. The second part concerns the potential benefits of roads on the Forest's ability to suppress a wildland fire.

A. Fire Facilities
B. Fire Occurrence and Prevention
C. Fire Suppression

D. Escape Routes for Public Safety

A. Fire Facilities

The forest transportation system is used to provide access to fire facilities such as lookouts, trailheads, water sources, helicopter staging areas; fire breaks for fire suppression; and from a safety standpoint, anchor points for pre-positioning firefighting resources and fire line construction and constructed and maintained fuel breaks. Access is also required at times to unimproved facilities such as traditional detection viewpoints.

The access benefit ratings for fire facilities are:

High - Roads that access improved fire facilities
Moderate – Roads that access unimproved fire facilities and historical viewpoints used for detection (On the High Cascades District these include Twin Ponds Trailhead, Oak Mountain, Skeeters Point, Hammaker Bluff, Red Blanket Mountain, Bessie Rock)

B. Fire Occurrence and Prevention

Most fires are lightning caused, and are spread fairly evenly across the zone (there is a somewhat higher occurrence in the higher elevations). Human caused fires occur mainly around recreation and woods related operations sites, and are closely related to access. Motorized vehicle use is typically restricted during times of high fire danger through the implementation of the Forest's fire restrictions and Forest Closure Order process. Where there are no open roads, the occurrence of human caused fires is lower. Fire prevention strategies include fire patrols during periods of high fire danger. The primary transportation system maintained in good condition facilitates quicker access to a greater percentage of the Forest for each patrol.

Fire Occurrence

High – The primary transportation system - roads that provide the primary access to HUC 6 watersheds and roads that provide critical access to adjoining agency lands (Klamath National Forest and BLM lands).

C. Fire Suppression

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

To provide access for firefighters and equipment during fire suppression operations, there are characteristics that make one road more valuable than another. The target vehicle for fire suppression access would be a high clearance vehicle such as pick-ups, crew carriers, and wildland fire engines, all of which designed to operate on a road maintenance level 2. Some roads are more important because of obvious safety reasons to do with the lay of the land, such as ridge tops vs. mid slope, and fire behavior. All roads do have potential value from a fire suppression stand point, including access and use a fire breaks; however open roads also have the potential to increase the risk of unplanned fire ignitions.

Fire Suppression

High - The primary transportation system (access to HUC 6 watersheds), as well as loop roads
Moderate - Secondary roads that provide access to HUC 7 watersheds
Low – All roads not mentioned in Moderate or High ratings but are identified by the Fire Staff as important for other reasons such as safety lookouts.

D. Escape Routes for Public Safety

In the event of a fire blocking the primary access route to a developed recreation or administrative site, or to private homes, an alternate route for evacuation can be critical. These routes need to be maintained to accommodate passenger cars safely (maintenance level 3 or above).

Escape routes

High – routes determined to be critical as a secondary evacuation route from a developed recreation site, administrative site or from any high public use area on the Forest. All roads identified as escape routes must remain a part of the transportation system.

3. Vegetation Management

Roads provide access for implementation of silviculture prescriptions and vegetation management treatments. The following strategy was developed to prioritize the access needs to accomplish this work based on categories of land identified in the Northwest Forest Plan and the Forest Land Management Plans. In December 2003, the Forest Service Washington Office approved administrative consolidation of the Rogue River and Siskiyou National Forests. Both forests were under the Northwest Forest Plan, but each forest plan has differences in implementation.
The Rogue River-Siskiyou National Forest consists of three land categories identified in the Plans.

A. Adaptive Management Area (AMA)
B. Late Successional Reserve (LSR)
C. Matrix Lands, (Potential Areas for Resource Enhancement)

The defining land category for most of this area, about 160,000 acres of Forest Service land, is AMA. The east portion, including the Ashland Municipal Watershed and Tolman/Upper Neil Creek is LSR. In addition, the Siskiyou Area shares an LSR (Johnny Oneil-354) with the Klamath NF.

A. Adaptive Management Areas

The intent of this area designation in the Northwest Forest Plan is to develop and test new management approaches to integrate and achieve ecological, economic, and other social and community objectives, working with other organizations, government entities and private landowners in accomplishing those objectives. Each area has a different emphasis to its prescription, such as maximizing the amount of late-successional forests, improving riparian conditions through silvicultural treatments, and maintaining a predictable flow of harvestable timber and other forest products. The intent is that a portion of the timber harvest will come from these lands. Lands designated in the Forest Land Management Plan that allow timber harvest include the following Management Strategy Designations:

MS 6 - Foreground Retention	MS 7 - Foreground Partial Retention
MS 8 - Middleground Retention	MS 9 - Middleground Partial Retention
MS 14- Big Game Winter Range	MS 20- Timber Suitable I
MS 21- Timber Suitable 2	MS 23- Managed Watershed

For these areas Satellite Vegetation Mapping has been completed and provides the following vegetation classes which are used to rank the importance of the road network for silvicultural treatments:

Shrub

Early < 11” dbh (diameter breast height) with varying crown closure
Open Scattered Canopy > 11” dbh & < 60 % canopy

Mature 11-16.9" dbh & > 60 % canopy closure
Mature 17-20.9" dbh & > 60 % canopy closure
Late 21-27.9" dbh & > 60 % canopy closure
Late 28 +dbh & > 60 % canopy closure

Adaptive Management Area

Low - Shrub, Early, Open Scattered and Late 28" + dbh
Moderate - Late 21-27.9" dbh
High - Mature 11-16.9" dbh, Mature 17-20.9" dbh

B. Late-Successional Reserve Lands (LSR) and Special Forest Products

Southwest Oregon LSRs are part of a regional network designed in association with other land allocations (riparian reserves, National Parks, Wilderness, botanical areas, etc.) to provide functional late seral habitat, including long-term dispersal and migratory pathways. The intent of LSR designation is to protect current old-growth forests and wildlife habitat, as well as develop future old-growth habitat. Within LSRs, forests older than 80 years are protected from logging unless it will benefit creation of old-growth forest conditions. Younger stands within LSR boundaries can be thinned as long as it is deemed neutral or beneficial to the creation of old-growth forest conditions.

Roads supporting silvicultural activities in LSR's are important for fire risk reduction and to a lesser degree enhancing Late Successional habitat. The effects to habitats of concern from not implementing salvage, reforestation, seeding, road treatments, meadow expansion, and meadow encroachment reduction are minor when compared to the effects of not implementing treatments that reduce the potential for future high intensity fires. Not implementing Fuel Management Zones (FMZs), especially high priority FMZs - and to some extent high priority landscape prescribed burning, would have the greatest adverse effect to late-successional forest habitat and associated species, because this would increase the probability of suppressing low intensity fires, which are beneficial to maintenance of this habitat. In addition, exclusion of low intensity fire increases the potential for high intensity fires over time, which increases the potential for losing late-successional forest habitat. The continued loss of late successional forest habitat to high intensity fire could lead to local extirpation of species associated with this habitat. Priority would be to protect large blocks of late-successional habitat from severe fire.

Late-Successional Reserve Lands:
Siskiyou Mountains Ranger District:
Moderate - Mt. Ashland LSR-248, above 2060 road
High - Mt. Ashland LSR-248, below 2060 road and Lower Tolman area

High Cascades Ranger District:

Moderate - Areas within LSR 222 (expansion and connection), LSR 227 (enhance late seral conditions), LSR 226 (enhancing and connecting late seral blocks), LSR 225(enhancing and connecting late seral blocks).
High - Areas within LSR 222 (fire risk reduction), LSR 227 (fire risk reduction)

Special forest products access needs were used to select and rate roads as high or low benefit on Wild Rivers Ranger District, Gold Beach Ranger District and Powers Ranger District. Special forest products include cutting and removal of personal-use firewood, boughs, bear grass, foliage, and mushrooms. The demand for

particular products leads to access needs at different times of the year. Observations by field personnel indicate that certain areas and road systems are used more heavily than others for access.

Low - Roads not selected by field personnel
High - Roads selected as heavy use for access of forest special products.

C. Matrix Lands

Matrix lands, land allocations capable of supplying programmed timber harvest, are considered higher priority for ease of access for pre and post-sale activities than non-Matrix lands, except where Late-Successional Reserve (LSR) Priorities for the RRNF identify high priority areas for silviculture/fuels treatments in LSRs.

Matrix lands are identified by the following management strategies (MS) located in the RRNF forest plan:

MS 6	Foreground Retention	MS 7	Foreground Partial Retention
MS 8	Middleground Retention	MS 9	Middleground Partial Retention
MS 14	Big Game Winter Range	MS 20	Timber Suitable 1
MS 21	Timber Suitable 2	MS 23	Managed Watershed

The vegetation condition class GIS layer example below was used for identifying opportunities for potential treatment areas within Matrix lands.

PT	Poles thinning opportunity	MT	Small saw thinning opportunity
MM	Mature	NS	Non-stocked (including failed plantations
SO	Sapling stocked (1 – 4.9” dbh)	SL	Sapling low stocking (1 – 4.9” dbh)
SH	Shelterwood		
MH	Mature habitat	OG	Old Growth
RO	Seedling stocked (<= 1” dbh)	RL	Seedling low stocking
PN	Poles no thinning opportunity	MN	Small saw no thinning opportunity
RR	Range opportunity	NF	Non-forest
WW	Water	OT	Other

Matrix Lands

Low - PN, MN, RR, NF, WW, OT condition class
Moderate - MH, OG, RO, RL condition class
High - PT, MT, MM, NS, SO, SL, SH condition class

4. Other Needs

A. Legal Requirements

Within the Analysis Area there are several roads that are covered by cost share agreements. Cost share roads are a major part of a high value transportation system mutually needed by the Forest Service and private timber companies. The parties jointly share in the capital investment for the construction, reconstruction and maintenance of the road. The Forest Service has granted to the Cooperator a private interest right in the use of the Forest Roads they share. Cost share Cooperators retain the rights to use these roads for access to their land, however the Forest Service retains jurisdictional control of the roads.

Legal Requirements

High – Cost Share Roads and roads covered by easements.

B. Range Facilities

There are a number of existing improvements on the Rogue River-Siskiyou National Forest that facilitate managing the range program. These facilities include cabins, corrals, and livestock water improvements. Permittees need direct and regular road access to the cabins and corrals.

Range Improvements

Moderate – Roads accessing fences, springs and other developments
High – Roads accessing cabins and corrals and main roads to allotments

C. Administrative Sites

Roads provide access to offices, work centers, dams, and Forest Service communication sites.

Administrative site

High – any road accessing one of these sites

D. Other Factors

Road access is less commonly needed for a variety of uses in addition to the five described above. Existing road systems that access mining claims are a special concern. According to Code of Federal Regulations (CFR) 36 2800.12, a claimant has a right to use existing roads, or to construct roads in order to access mining claims on Federal Forest System Lands with an approved plan of operation. Location of existing mining claims will be identified to determine access needs.

Other Factors: Provides access to sites

High – Roads accessing sites such as unique cultural, traditional, symbolic, sacred, spiritual, and religious significant sites
Moderate- Roads accessing special use sites such as communication sites, water distribution canals, concessionaires, utility corridors, and prescriptive rights
Low-Roads serving Forest lands but also accessing other agency or private lands or roads needed for mineral extraction

Scoring and Rating

Overall risk and benefit assessment was based on aggregate scores from each resource (IDT member) risk and benefit rating for each road. Each road was rated as high, medium, or low based on criteria described under Evaluation Criteria above. Resource scores were totaled for the overall benefit and risk ranking for each road.

There are four benefit criteria and four resource risk criteria for each road. Scores were based on a point system where a high rating equaled 3 points, a medium rating - 2 points, and a low rating - 1 point. Roads with no risk were rated zero for wildlife, botany and management area direction categories. Road benefits were rated similar to risk rating where a high rating equaled 3 points, a medium rating - 2 points, and a low rating - 1 point. Road with no identified benefit were scored zero. The overall scores for risk range from 1 to 12 (possible 3 points for each criteria) and from zero to 12 for benefits. Table 3 displays the benefit/risk numeric point distribution for low, medium and high scores.

Table 3. Benefit/risk - low, medium, high score rating distribution

Rating	Benefit	Risk
Low	0 to 3	1 to 4
Medium	4 to 7	5 to 8
High	8 to 12	9 to 12

The IDT decided that the range for overall (combined resource score) high, medium, and low benefits and risk would be based on the number of resources affected by the road and the intensity of those effects as described by the specialist's rankings described above and shown for each road in Appendix A spreadsheet. The IDT, preparing the travel analysis process (TAP), set the inclusive numeric rating for each low, medium and high matrix cell (numeric group).

The IDT developed the point distribution to group road miles in matrix cells used to identify road segments with lowest benefit and highest risk ratings for management groups, displayed in Tables 8 and 9.

Table 4 displays evaluation results of the score (point) range for high, medium and low benefit, road miles and percent of miles in each score group.

Table 4. Benefit score range, miles distribution and percent of road miles by score group

	Point Range	Overall Score	Roads Miles	Percent of Total Miles
BENEFIT	0-3	Low Benefit	2,967	57
	4-7	Medium Benefit	1,303	25
	8-12	High Benefit	913	18
	Total		5,183	100

Table 5 displays the risk score range for high, medium and low road miles and percent of miles in each score group.

Table 5. Risk score range, miles distribution and percent of road miles by score group

	Point Range	Overall Score	Roads Miles	Percent of Total Miles
RISK	1-4	Low Risk	2,099	40
	5-8	Medium Risk	2,543	49
	9-12	High Risk	541	11
	Total		5,183	100

A benefit rating example is displayed in Table 6.

Table 6. Example of benefit scoring

Criteria	Benefit Categories	H, M, and L Rating	Points for each Rating
1	Recreation access	M	2
2	Fire management, agency and public access	L	1
3	Vegetation management access	L	1
4	Other access needs, authorized uses and administrative facilities access	L	2
Total Points:			**6 out of 12 possible (Medium Benefit)**

The example road in Table 6 scored 6 points and would be rated medium benefit. A risk rating example is displayed in Table 7.

Table 7. Example of risk scoring

Criteria	Risk Categories	H, M, and L Rating	Points for each Rating
1	Aquatic	M	2
2	Wildlife (terrestrial)	H	3
3	Botanical	L	1
4	MAs (Forest Plan direction)	M	2
Total Points:			**8 out of 12 possible (Medium Risk)**

Based on this example, the overall score for this road would be medium for benefit and medium for risk. Appendix A – Benefit and Risk Assessment spreadsheet displays each resource rating and overall benefit and risk results for each road.

Distribution of Benefit and Risk Assessment

Benefit and Risk Matrix for all System (ML 1 to ML 5) Roads

Of the total 5,183 miles of existing National Forest System Roads (ML1 – ML5), 2,216 miles, 43 percent, rated medium or high benefit. These medium and high benefit roads are important for Forest Service management and public use. Of those roads that ranked medium or high benefit, 462 miles, 9 percent of total road miles, rated high risk due to resource concerns. These high risk/medium benefit and high risk/high benefit roads should be the focus of road maintenance funds to mitigate adverse effects and lower impacts of the transportation system on natural resources.

Table 8 is the risk and benefit matrix with miles and percent of miles for all roads analyzed with general management opportunities and priorities for each matrix cell.

Table 8. Roads risk and benefit matrix and recommendations for existing National Forest System roads

ROADS - OPERATIONAL ML1 TO ML5	
RISK [1]	BENEFITS [2]

	Scores	Low 0-3	Medium 4-7	High 8-12
	High 9-12	(HL) Decommission, Lower ML, or Mitigate – Highest Priority **(79)[3] or (1%)[4]**	(HM) Decommission, Mitigate, Close or Lower ML – High Priority **(136) or (3%)**	(HH) Maintain and Mitigate, Close or Decommission - Highest Priority **(326) or (6%)**
	Medium 5-8	(ML) Close, Mitigate, Decommission or Lower ML **(1198) or (23%)**	(MM) Mitigate and Maintain – Second Priority **(812) or (15%)**	(MH) Mitigate and Maintain - Second Priority **(534) or (10%)**
	Low 1-4	(LL) Mitigate, Lower ML, Close or Decommission, **(1690) or 33%)**	(LM) Maintain Third Priority **(356) or (7%)**	(LH) Maintain Third Priority **(53) or (1%)**
TOTAL OPERATIONAL ML1 TO ML5 = 5183 MILES				

[1] Risks represent the range of total risk scores assigned to each category.
[2] Benefits represent the range of total benefit scores assigned to each category.
[3] Road miles assigned to each cell in the matrix.
[4] Percent of total system road miles in each cell.

Road Maintenance Costs

Forest Service road budgets have been steadily declining for the past 20 plus years. Region-wide, the amount of funding for road work including both appropriated funding and work contributed by commercial users is less than 20 percent of what it was 20 years ago. Appropriated road funds to the Pacific Northwest Region (Region 6) have been reduced 40% in the past 5 years alone. Current levels of funding for road work on the Rogue River Siskiyou National Forest are shown in Table 9 below.

Table 9: 5 year average road funding

BLI	Forest Operational Budget to Road Maintenance					5 Year Average	Average Mtc Budget
	2011	2012	2013	2014	2015		
CMRD	272,841	292,630	107,462	92,000	79,968	168,980	$168,980
CMLG	60,000	0	20,443	0	65,000	29,089	$29,089
CWF2	352,062	116,802	187,000	136,000	227,000	203,773	$203,773
Title II	336,023	185,999	75,000	173,000	0	154,004	$154,004
Purchaser Mtc	262,340	306,230	298,000	327,000	310,000	300,714	$300,714
Other non-FS	37,000	31,850	36,983	58,000	63,000	45,367	$45,367
							$901,927

5YR Ave Mtc Budget	Range	
	-20%	+20%
$901,927	**$721,541**	**$1,082,312**

With funds being far below what is necessary to keep the road system properly maintained, many roads do not get the maintenance treatments they need on schedule and are falling into a severe state of disrepair.

> Deferred Maintenance is defined as "maintenance that was not performed when it should have been or when it was scheduled and which, therefore, was put off or delayed for a future period. When allowed to accumulate without limits or consideration of useful life, deferred maintenance leads to deterioration of performance, increased costs to repair, and decrease in asset value", (Financial Health - Common Definitions for Maintenance and Construction Terms, July 22, 1998).
>
> Annual Maintenance is defined as "work performed to maintain serviceability, or repair failures during the year in which they occur. Includes preventive and/or cyclic maintenance performed in the year in which it is scheduled to occur", (Financial Health - Common Definitions for Maintenance and Construction Terms, July 22, 1998).

Since 1999, the Forest Service has been tracking the amount of the deferred maintenance backlog. Based on national estimates (from 2013), the Rogue River - Siskiyou NF, would need approximately $111.6 million to bring their entire road system back up to standard, and about $11.6 million per year to keep it that way. (Please note that the unit costs used to arrive at the figures above are made up of national averages to restore and maintain the road system in a like new condition. They also include the cyclical items necessary to replace gravel surfacing, pavement overlays, bridges/structures, and major culverts on schedule, and include a 40% overhead rate.)

Our local estimate, (using regional unit rates and not including the national burden rate) indicates that the Rogue River - Siskiyou NF would still require about $6.9 million per year to keep the current road system fully maintained to standard. Table 9 above, shows that on average, the Rogue River - Siskiyou N.F. only receives about $900,000 dollars per year, (including maintenance performed by commercial users), that can be applied toward road maintenance work, that is only about 8% of the funding necessary to address the estimated annual maintenance needs to fully maintain the road system.

Financial Analysis Process

The goal of the financial analysis step in the overall Travel Analysis Process is to identify opportunities to help move the road system to a more affordable state.

Based on the figures in the previous section, if the Rogue River - Siskiyou National Forest were to focus their available appropriated funds on a given set of roads to fully maintain to standard, they would only be able to maintain about 99 miles of roads if they were all paved, or about 185 miles of roads if they were all gravel surfaced. That size of road system would not meet the needs of the forest or the public, and does not meet the requirements of the 2005 Travel Management Rule as it would not allow the forest to meet resource management objectives in the Forest Plan and would not allow the forest to meet statutory and regulatory requirements.

Given the enormous gap between available appropriated funding for road work and the cost to maintain the road system fully to standard, the Region recognized that it would not be possible to balance the size of the road system with the cost of maintaining all roads fully to standard and still be able to meet resource management needs or the needs of the public. Since the requirement in the Travel Management Rule to "reflect long-term funding expectations" was not defined in regulation or policy, Region 6 defined it in the *R6 Guidance for Preparing a Travel Analysis Report* document to mean that "average annual funding" is reasonably in balance with the "average annual cost of routine road maintenance", where:

Average annual funding is defined as the average amount of funding available for each NFS unit for routine annual maintenance from appropriations, collection accounts, commercial users, cooperators, and other partners during the 2011-2015 timeframe, plus or minus 20%. It does not include funding from the American Recovery and Reinvestment Act (ARRA) or the Capital Improvement Program (CIP). Only the modest amounts specified for "routine maintenance" in Legacy Roads and Trails funding allocations are included.

Average annual cost of routine road maintenance is defined as the average yearly need for basic road maintenance. This includes log out, drainage maintenance, erosion control, blading, brushing, traffic signs, etc. It does not include cyclical replacement costs (such as bridge replacement every 50 years, asphalt overlays, etc.), which are covered by funding beyond the individual NFS unit budgets (e.g., Regional Capital Investment Program).

The Rogue River - Siskiyou National Forest utilized the *Region 6 Financial Analysis Template,* which is based on the definitions above, to perform the financial analysis. A full discussion of the Financial Analysis Process is provided in Appendix G. In summary, the first steps of the financial analysis process lead to a determination of the current road maintenance costs for routine annual maintenance items, (which does not include things like replacing gravel surfacing, replacing pavements, or replacing bridges and structures), the current cost of keeping up the existing road system to this standard for the Rogue River - Siskiyou NF would be about $3.6 million dollars per year, or roughly four times the amount of currently available funding for this type of work. The second part of the financial analysis process helps identify what types of changes to the size and composition (pavement vs gravel surfacing, maintain for passenger car vs only maintain for high clearance vehicles, etc.) of the road system would be needed to bring the average annual costs in balance with the average annual funding expectations. The results of the financial analysis show that the forest would need to make some significant changes to reduce the number of miles of open roads, (by decommissioning any that are no longer needed, and by closing those that are only needed for intermittent project uses), and by lowering the maintenance standards of the roads that remain open year around. Further discussion of available options is provided in Appendix G.

Step 5: Describe Opportunities and Priorities

Purposes

The purpose of this step is to:

Compare existing motor vehicle use with desired conditions, and describe options for modifying the forest transportation system to achieve desired results.

Identify management opportunities and priorities and formulate proposals for changes to the forest transportation system that respond to the issues, risks, and benefits identified previously in the analysis.

Develop guidelines for mitigating road risks.

Road Management Opportunities

Management opportunities for roads were identified through the GIS risk/benefit rating evaluation for each resource in step 4 of the analysis. Roads groups by maintenance level in each matrix cell were evaluated by the IDT for opportunities based on the combined total benefit and risk rating score.

Road maintenance funding needs were also a consideration when identifying management opportunities. A roads analysis helps identify ways to more efficiently utilize the limited road maintenance dollars allocated to the Forest. One approach is to reduce or eliminate expenditures on roads not needed or not needed at their current maintenance level. Maintenance level groups described in Table 9 and 10, along with the roads list in spreadsheet in Appendix A, identify management opportunities and can be used to prioritize roads for available maintenance funds.

Final management decisions would be done after ground truthing and scoping with site-specific project level NEPA analysis. A complete road list with overall rankings, and specific management opportunities, for each road segment, is located in Appendix A.

Management opportunities for road miles in each of the nine matrix cells from Table 8, and included in the Appendix A spreadsheet for each road, include these risk/benefit groups (risk/benefit):

1. HL, Decommission, lower maintenance level or mitigate – highest priority
2. HM, Decommission, close, lower maintenance level or mitigate – high priority
3. HH, Mitigate, close, maintain, decommission - highest priority
4. ML, Close, lower maintenance level, mitigate or decommission – second priority
5. MM, Mitigate and maintain - second priority
6. MH, Mitigate and maintain - second priority
7. LL, Close, lower maintenance level, mitigate or decommission – third priority
8. LM, Maintain – third priority
9. LH, Maintain – third priority

Table 10 displays road management opportunities, total road miles and road miles by maintenance level for each risk/benefit category.

Table 10. Road management opportunities for risk/benefit categories

Risk / Benefit	Opportunities for Roads

Table 10. Road management opportunities for risk/benefit categories

Risk / Benefit	Opportunities for Roads
Low Risk / Low Benefit	**Decommission, close,[1] lower maintenance level, or mitigate**
1690 miles **358 miles of ML1 Roads** **1316 miles of ML2 Roads** **10 miles of ML3 Roads** **6 miles of ML4 Roads** **0 miles of ML5 Roads**	If there is no long term administrative or public need for a road, consider decommissioning or conversion. If there is a future need for the road but no immediate need, consider retaining on the system as a closed (ML1) road. Closed roads are closed for at least one year, but can be re-opened for future administrative or public access needs. The low risk associated with these roads indicates low need and priority for mitigation. Drainage feature maintenance and erosion prevention are the highest priority issues for these low risk roads. Mitigate adverse effects on other resources.
Low Risk / Medium Benefit	**Maintain – Priority 2**
356 miles **39 miles of ML1 Roads** **267 miles of ML2 Roads** **50 mile of ML3 Roads** **0 miles of ML4 Roads** **0 miles of ML5 Roads**	The majority of these roads should remain open for administrative and public use, depending on access and resource management objectives. The Forest Service may consider working with cooperating agencies or user groups to provide adequate maintenance for roads in this category that are important for public access. Low risk associated with these routes indicates low need and low priority for mitigation.
Low Risk / High Benefit	**Maintain – Priority 3**
53 miles **0 mile of ML1 Roads** **26 miles of ML2 Roads** **22 miles of ML3 Roads** **5 miles of ML4 Roads** **0 miles of ML5 Roads**	The Forest Service should work with cooperating agencies to provide adequate maintenance for roads in this category that are important for public access. Low risk associated with these routes indicates low need and priority for mitigation.
Medium Risk / Low Benefit	**Decommission, close, mitigate or reduce maintenance level**
1198 miles **251 miles of ML1 Roads** **908 miles of ML2 Roads** **32 miles of ML3 Roads** **7 miles of ML4 Roads** **0 miles of ML5 Roads**	General public motorized access is not recommended for these roads, unless the road is essential for public access. Most of these roads should be closed or decommissioned. If there is no long-term public or administrative need for the road, it should be considered for decommissioning. If there is long-term public or administrative need for the road, consider lowering the maintenance level.

[1] To "close" a road means that its maintenance level is lowered to ML 1. These roads still exist on the ground in a stabilized state, but vehicular access is prohibited. Future required use is foreseen.

Table 10. Road management opportunities for risk/benefit categories

Risk / Benefit	Opportunities for Roads
Medium Risk / Medium Benefit	**Mitigate – Maintain Priority 2**
812 miles **50 miles of ML1 Roads** **560 miles of ML2 Roads** **177 miles of ML3 Roads** **24 miles of ML4 Roads** **0 miles of ML5 Roads**	The majority of these roads should remain open. Associated medium resource risks may require mitigation. Mitigation depends upon specific risks and may include, but is not limited to: drainage structure improvement, spot surfacing, additional maintenance, reconstruction, relocation, or seasonal road closure. The scale and frequency of these activities would depend on risk severity and available funds. Roads ranked Medium Risk/Medium Benefit could be considered for lowering the maintenance level.
Medium Risk / High Benefit	**Mitigate and Maintain - Second Priority**
534 miles **0 miles of ML1 Roads** **204 miles of ML2 Roads** **308 miles of ML3 Roads** **21 miles of ML4 Roads** **1 mile of ML5 Roads**	The majority of these roads will remain open for administrative and public use, depending on resource and recreation management objectives. Associated medium risks may require mitigation. Mitigation depends upon specific risks and may include, but is not limited to: drainage structure improvement, spot surfacing, additional maintenance, reconstruction, relocation, or seasonal road closure. The scale and frequency of these activities will depend on risk severity and available funds. Roads ranked Medium Risk/High Benefit and High Risk/High Benefit categories may be allocated for higher priority mitigation and maintenance funding or lowering maintenance level.
High Risk / Low Benefit	**Decommission, mitigate or lower maintenance level – Highest Priority**
79 miles **9 miles of ML1 Roads** **65 miles of ML2 Roads** **5 miles of ML3 Roads** **0 mile of ML4 Roads**	Vehicle access is not recommended on some of these roads based on the Risk/Benefit Analysis. Roads in this category should be considered for closure or decommissioned. If benefits are sufficient to retain the road as open or maintenance level 1 (closed), it is a high priority for mitigating risks. Coordinate with county government or private landowners to determine maintenance responsibility on roads needed for access to private lands. If a road's primary use is access to communities, request public roads agencies (county, towns, state government) to assume road operational jurisdiction. If a road is needed exclusively for access to private land or needed to manage activities under special use permits, consider issuing a permit for the road that places maintenance responsibilities on the permittee If roads or road segments are not open to the public and not under permit, consider decommissioning.

Table 10. Road management opportunities for risk/benefit categories

Risk / Benefit	Opportunities for Roads
High Risk / Medium Benefit **136 miles** **3 miles of ML1 Roads** **94 miles of ML2 Roads** **36 miles of ML3 Roads** **3 miles of ML4 Roads** **0 miles of ML5 Roads**	**Mitigate, close, lower maintenance level or decommission** Consider closing or lowering maintenance level on roads within this category that have public benefit. Decommission roads not needed for future management access. High risks associated with these routes may require mitigation. Mitigation depends upon specific risks and may include, but is not limited to: drainage structure improvement, spot surfacing, additional maintenance, reconstruction, relocation, or seasonal road closure. The scale and frequency of mitigation activities would depend on risk severity and available funds.
High Risk / High Benefit **326 miles** **0 miles of ML1 Roads** **38 miles of ML2 Roads** **148 miles of ML3 Roads** **101 miles of ML4 Roads** **39 miles of ML5 Roads**	**Maintain and mitigate or close - Highest Priority** Most of these routes are needed for resource management or general public access to the Forest. Some routes may be open for administrative use only, to control access to sensitive cultural or biological resources. High risks associated with these routes may require mitigation. Mitigation depends upon specific risks and may include, but is not limited to: drainage structure improvement, spot surfacing, additional maintenance, reconstruction, relocation, or seasonal road closure. The scale and frequency of these activities would depend on risk severity and available funds.

Table 10 displays maintenance level road miles (summarized in Table 8) and percent of total road miles for each matrix cell. Table 9 road miles are subdivided by maintenance level with applicable management opportunities developed by the IDT in Table 10. Management opportunities for each road (by road number) are included in Appendix A spreadsheet.

Table 11. Road management opportunities by risk/benefit categories, all system roads, miles and % of total (5183) road miles (07-20-15)

Score	0-3 Benefit	4-7 Benefit	8-12 Benefit
Risk 9-12	**HL**[1] ML1 (9 miles) • Mitigate and retain ML1, high benefit for rec, other uses, admin, fire (0 miles) • Decommission all other ML1 (9 miles) ML2 (65 miles) • Mitigate and retain at ML2 if high benefit for rec, other uses/admin, fire (3 miles) • Decommission all other ML2 roads (62 miles) ML3 (5 miles) Change to ML 2 and mitigate (5	**HM** ML1 (3 miles) • If rec or other uses and fire are high or medium, mitigate (3 miles) • Decommission remainder of ML 1 roads (0 miles) ML 2 (94 miles) • If rec or other uses and fire are high or medium, retain at existing ML 2 and mitigate (94 miles) • Remainder of ML 2	**HH** ML1 (0 miles) ML2 (38 miles) • If rec, fire or other uses are high or medium, (retain at ML 2) (38)miles) • If fire is low, close (change to ML1) (0 miles) • Remainder ML 2 roads mitigate and retain at ML 2 (0 miles) ML3, (148 miles)

Score	0-3 Benefit	4-7 Benefit	8-12 Benefit
	miles) ML4 (0 mile) ML5 (0 miles) **Total miles 79 (1%)**[2]	close – change to ML 1 (0 miles) ML 3, (36 miles) • If rec is high or medium, retain (mitigate) at existing ML 3 (36 miles) • Remainder of ML 3 roads change to ML 2 (0 miles) ML 4 (3 miles) Mitigate and retain at existing ML 4 ML 5 (0 miles) **Total miles 136 (3%)**	• Retain ML 3 roads with high recreation benefit rating at ML 3 (102 miles) • Remaining ML-3 roads, or (roads with medium and low rec benefit) reduce to ML-2 (46 miles) ML 4 (101 miles) Retain at ML 4 if Rec an Other are high (101 miles) Remainder of ML 4 Reduce ML to 3 (0 miles) ML 5 (39 miles) Retain at existing ML and mitigate. Highest priority **Total miles 326 (6%)**
Risk 5-8	**ML**[1] ML1 (251 miles) • If benefit for rec, other uses/admin, or fire are high, mitigate (retain at ML1) (0 miles) • Decommission remaining ML1 roads (251 miles) ML2 (908 miles) • If high benefit for rec, high and moderate for other uses/admin, or high for fire, mitigate (retain at ML2) (61 miles) • Remaining ML 2, close (change to ML1) (847 miles) ML3 (32 miles) • If rec rating is high, retain at ML 3 and mitigate (0 miles) • Other existing ML 3, change to ML 2 (32 miles) ML4 (7 miles) mitigate **Total miles 1198 (23%)**	**MM** Mitigate and maintain – Second Priority ML1 (50 miles) ML2 (560 miles) ML3 (177 miles) • If benefit for rec, other uses/admin, or fire are high, mitigate (retain at ML3) (120 miles) • Remainder ML 3 lower ML to 2 (57 miles) ML4 (24 miles) maintain ML5 (0 miles) **Total miles 812 (16%)**	**MH** Mitigate and maintain – Second Priority ML1 (0 miles) ML2 (204 miles) ML3 (308 miles) ML4 (21 miles) ML5 (1 mile) **Total miles 534 (10%)**
Risk 1-4	**LL**[1] ML1 (358 miles) • If high benefit for rec, other uses/admin, or fire, mitigate (retain at ML1) (0 miles)	**LM** Maintain – Third priority ML1 (39 miles) ML2 (267 miles) ML3 (50 mile)	**LH** Maintain – Third priority ML1 (0 miles) ML2 (26 miles)

Score	0-3 Benefit	4-7 Benefit	8-12 Benefit
	• Remaining ML1 roads, decommission (358 miles) ML2 (1316 miles) • If high and/or moderate benefit for rec, other uses/admin, or fire, - mitigate (retain at ML 2) (132 miles) • Remaining ML2 roads, also retain at ML2 (1184 miles) ML3 (10 miles) • If rec rating is high, mitigate at ML 3 (0 mile) • Remaining ML3 roads, change to ML 2 (10 miles) ML4 (6 miles) mitigate **Total miles 1690 (33%)**	ML4 ML5 **Total miles 356 (7%)**	ML3 (22 miles) ML4 (5 miles) ML5 **Total miles 53 (1%)**

[1] Note: Score rating, H = high (3), M = medium or moderate (2), L = low (1); First letter is risk, second letter is benefit.
[2] Percent of total road miles

Actions that Respond to the Issues

The following are suggested strategies the Forest may employ in project planning (see Step 3). The scale at which these actions may be implemented depends on site specific needs and compatibility of the action with overall forest plan management direction for the project area. The list below is intended to provide options that project leaders and decision-makers may consider when implementing changes to the road system.

Issue 1: Insufficient resources for maintaining existing system roads

Action: Reduce the number of road miles that need to be maintained or reduce the maintenance level to reduce maintenance costs. Reducing road miles that need to be maintained by converting closed roads to motorized trails would increase trail maintenance costs and is not a recommended action to reduce maintenance costs.

Action: Leverage funds to increase maintenance capabilities. Continue to seek opportunities with other Forests, counties and private individuals to increase the amount of maintenance through cooperative funding. Work with volunteers to maintain trails to free up more funding for road maintenance.

Action: Prioritize roads that could be transferred to county jurisdiction for county maintenance. NFS roads that provide access to private inholdings could be transferred to county jurisdiction or maintained by private parties.

Issue 2: Need for landowner access to private lands and state lands

Action: Maximize cooperation from landowners by proposing to issue a reciprocal easement.

Action: Transfer road jurisdiction to the county.

Action: Enter into a special use agreement with landowners, stipulating that the permittee has maintenance responsibilities.

Issue 3: Human-caused fire and need for evacuation routes during wildfires.

Action: Close roads (rather than decommission) in high fire risk areas, for use as fire control lines, motor vehicle and equipment access during prescribed burns and wildfires.

Issue 4: Need for evacuation routes during wildfires.

Action: Retain selected roads for public evacuation if a wildfire should occur.

Issue 5: Restrict motorized vehicle use on the forest to designated system and trails through travel management.

Action: Install travel control signs, physical barriers or other devises that discourage using unauthorized roads. Use natural material to prevent use (downed trees, boulders, etc.) where feasible. In areas where previous decommissioning efforts have been unsuccessful, more aggressive means may be needed.

Action: Monitor unauthorized roads after barriers are installed and other mitigation measures are implemented. Keep records of successful and unsuccessful strategies for discouraging travel to improve restoration actions.

Issue 6: Need for access to firewood and other forest products gathering areas.

Action: Identify areas with suitable firewood or other forest products along open system roads, and provide maps to the public. Periodically or seasonally open closed roads with firewood supplies (recent tree mortality) to reduce use of closed or unauthorized roads.

Issue 7: Road effects on wildlife habitat

Action: Reduce the number of roads located in occupied habitat for species-of-concern and species-of-interest.

Action: Place seasonal restrictions on roads through key nesting areas, roosting areas and other key wildlife habitat areas.

Action: Reduce road width and maintenance level to minimum needed for safe vehicle passage and to meet the intended need in important wildlife areas.

Issue 8: Road effects on watershed conditions.

Action: Implement guidelines (BMPs) for mitigating road risks to reduce soil and water impacts from roads.

Action: Provide information and education about motor vehicle regulations and responsible use of motorized vehicles on the National Forest. Provide information at trailheads, recreation sites, parking areas, web site and news releases.

Action: Install route numbers at road junctions to assist users with compliance of motor vehicle use regulations.

Action: Use education material to create public understanding of problems created by off road driving. Inform users of the motorized travel policy.

Action: Use enforcement to curtail off-road driving. Implement patrols and field presence at appropriate times of year (such as hunting season, holidays, weekends, etc.) in identified use areas. Inform users of the travel policy.

Action: Rehabilitate areas damaged by off-route driving. State recreation trail programs, EPA's Clean Water Act 319 grant program, and state OHV funds are potential outside funding sources to rehabilitate and revegetate damaged areas in addition to federal appropriations.

Issue 9: Roads provide public access for recreational purposes

Action: Maintain access to developed recreational sites.

Action: Maintain and update the Motor Vehicle Use Map.

Action: Maintain road signs in accordance with handbook direction.

Issue 10: Roads provide access for general forest management.

Action: Identify infrequently used roads, and effectively close ML 1 roads to reduce road maintenance costs (change other ML roads to ML1 or to a lower maintenance level).

Action: Maintain and update the Motor Vehicle Use Map if roads are closed through NEPA analyses and decisions.

Action: During project level NEPA process, consider closing (ML1) open roads or reducing maintenance level in the project area to reduce maintenance costs.

Guidelines for Mitigating Road Risks

General guidelines for mitigating risks discussed in previous sections are listed below.

- Maintain, improve, reconstruct drainage structures
- Construct additional cross drains, add culverts
- Rock or armor cross drains (armor outlets on fill slope)
- Add energy dissipaters, over-the-side drains, down spouts
- Blade, remove ruts, crown or reshape
- Improve or add surface to reduce sediment delivery
- Reduce clearing width or narrow road width where applicable
- Close or seasonally restrict road use to minimize adverse effects on water, soil, wildlife and other resources
- Continue inventory and evaluate extent of invasive plant species, spray or cut to prevent seed development and spread
- Incorporate non-native invasive species prevention and control in road maintenance plans
- Eradicate non-native invasive species before roads are decommissioned; monitor and follow-up treatment where needed

Decommissioning Guidelines

Road decommissioning results in removal of a road from the road system. The goal is to return the roadway to a more natural state where the roadway is hydrologically self-maintaining and to permanently remove it from the transportation system. To accomplish this, a number of techniques can be used, such as posting the road closed and installing waterbars or earth berms, posting and installing barriers or barricades, ripping and seeding, scattering slash or boulders, planting vegetation in the roadway, converting the road to a trail, and full reclamation by recontouring or restoring the original topography. There is a different cost associated with each of these techniques, and their effectiveness for deterring unauthorized motorized vehicle use varies as well. Planning closure method and location is important to ensuring effectiveness.

Decommissioning level 1 and 2 roads can consist of removing culverts, ripping and seeding, posting closed with signs, and installing waterbars to discourage unauthorized motorized vehicle use and ensure proper drainage over time.

Decommissioning level 3, 4, and 5 roads is generally more expensive than decommissioning most level 1 and 2 roads. When choosing a technique for road decommissioning, the objective is to eliminate the need for future road maintenance and restoring hydrologic function.

Level 3, 4, and 5 roads are usually wider than level 1 and 2 roads, have more culverts installed at designed intervals to cross drain the road, may be ditched, have better sight distances designed on horizontal and vertical curves, have larger cuts and fills, and are designed through the topography rather than with the topography. It is much more expensive to decommission these roads than level 1 and 2 roads. Given the cost, it may cost less to maintain level 3, 4, and 5 roads than to decommission them. However, future maintenance costs may not be the only factor to consider; other resource considerations may outweigh cost. For some level 3, 4, or 5 roads, high deferred maintenance costs could exceed decommissioning cost.

Decommission Options

- Balance cost with resource risk and treatment effectiveness when selecting methods for decommissioning roads.
- Convert roads to trails as a decommissioning method when recreation analysis indicates a need to expand, connect or improve the existing trail system in the area.
- Decommission by restoring the road to original contours when mitigating visual impacts is required by the forest plan or when necessary to assure eliminating vehicular traffic.

Step 6: Reporting

Purpose

The purpose of this step is to report key findings of the analysis.

Desired Condition of the Future Road System

Travel Management Rule, 36 CFR 212.5 (b) states:

> "…b) Road system--(1) Identification of road system. For each national forest, national grassland, experimental forest, and any other units of the National Forest System (Sec. 212.1), the responsible Official must identify the minimum road system (MRS) needed for safe and efficient travel and for administration, utilization, and protection of National Forest System lands. In determining the minimum road system, the responsible official must incorporate a science-based travel analysis at the appropriate scale and, to the degree practicable, involve a broad spectrum of interested and affected citizens, other state and federal agencies, and tribal governments. The minimum system is the road system determined to be needed to meet resource and other management objectives adopted in the relevant land and resource management plan (36 CFR part 219), to meet applicable statutory and regulatory requirements, to reflect long-term funding expectations, to ensure that the identified system minimizes adverse environmental impacts associated with road construction, reconstruction, decommissioning, and maintenance."

Key Findings of the Analysis

This report documents the science-based travel analysis which is a key first step towards identifying a minimum road system to meet the requirements of the Travel Management Rule above. The results of this Travel Analysis will be used by the responsible official for identification of the forest's minimum road system following appropriate NEPA analysis. The ID team has identified a variety of opportunities for making changes to current road management practices that would meet the direction in 36 CFR 212.5 (b). From the matrix opportunities described in Steps 4 and 5, approximately 680 road miles, 13 % of the road system, (618 miles of ML1 and 62 miles of ML2 roads), are likely not needed for future resource management purposes and should be further analyzed in NEPA for decommissioning. Approximately 847 miles of existing ML2 roads could be closed or changed to ML1. Approximately 150 miles could have the maintenance level reduced from ML 3 to ML 2, and 1 mile of ML4 roads could be lowered to ML 3.

All system roads ML 1-5 are included in this travel analysis report. The Forest leadership team did not include motorized trails, motorized use areas, or future road construction. Appendix A spreadsheet displays all roads with management opportunities for each road. The benefit-risk rating process was used to develop opportunities for making changes to the road system identified previously in Tables 9 and 10. Management opportunities included in the road spreadsheet data, Appendix A, were used to develop the Road Management Opportunity maps (4 maps in appendix D). The road management opportunity maps in Appendix D also display roads that are likely not needed for future use and will be further examined in the NEPA process for decommissioning and removal from the road system. Existing road maintenance levels are shown on maps in Appendix C.

Table 12 displays a summary of potential changes to the road system by maintenance level.

Table 12. Opportunities for changes to the existing road system (07-31-15)

Maintenance Level	Existing Miles	Likely Needed Miles	Potential ML Change Miles	Likely Not Needed Miles
ML 1	710	939 -		618
ML 2	3477	2718	847	62
ML 3	789	639	150	
ML 4	168	168		
ML 5	40	40		
Total	5183	4504	-	680

The opportunities for change summarized in this table are the IDT's recommendations based on the risk/benefit analysis in this report. Prior to any travel management decisions being made, including any roads being added or deleted from the system, site-specific analysis, including public involvement, would be completed through the NEPA process at an appropriate scale.

Financial Analysis Results

The Financial Analysis in Appendix G includes a scenario using the total mileages from the opportunity categories listed above to examine the potential reduction in maintenance cost needs if these changes were to be made. The results of that analysis show that total routine annual costs with these changes implemented, but keeping the maintenance standards of the remaining open roads roughly the same, would require approximately $2.6 million per year in annual maintenance funding. This is a reduction of approximately $1.3 million per year in routine annual maintenance funding needs, but still doesn't bring the average annual maintenance needs in balance with the average annual maintenance funding expectations. In order to further reduce the maintenance needs, the remaining open roads would require even further reductions to maintenance standards and frequency of work. By implementing those types of reductions, the total annual maintenance costs could be reduced to around $1.1 million per year, which does fall within 20% of the five year average funding level and would reflect long-term funding expectations according to Region 6 guidelines.

Capital Investments

The section above only considers road maintenance needs and costs, but there are also costs associated with any proposed road decommissioning, road closures, and road improvements necessary to address risks and environmental concerns that are identified in the TAP analysis. These costs are not included in balancing road maintenance funds because funding for these activities is not appropriated along with the normal road maintenance funds used in the calculations. Funding for this type of work generally comes though other programs such as capital investment programs, Legacy Roads and Trails funding, Federal Highway programs, partnerships with outside groups and agencies, etc. Estimated costs for these type of funds associated with the travel analysis opportunities identified in the TAP are shown in table 13.

Table 13. Estimated capital improvement costs and decommissioning work

Category	Miles	Cost / Mile	Total Cost
Estimated Cost to put roads in storage	939	$3,500	$3,286,500
Estimated Cost to decommission roads	680	$6,000	$4,080,000
Estimated Cost for improvement work	1200	$2,800	$3,360,000

Total			$10,726,500

Given the current trend in reduced funding for road maintenance work, and the enormous gap between current funding and need, it does not appear possible to identify a future road system where the entire cost of annual maintenance work necessary to fully maintain the roads to standard would be in balance with available funding, (i.e., to include annual maintenance items and cyclic capital costs for replacement of gravel surfacing, pavements, structures, bridges, etc.). In the Pacific Northwest Region, the size of road system to meet that requirement would be less than 200 miles per National Forest and would not allow forests to meet resource management objectives in their Forest Plans or to meet statutory and regulatory requirements. Because we will not have enough funding available to keep all road surfacing materials and structures replaced on schedule, we can expect the deferred maintenance backlog to continue to grow, and we will continue to see a decline in the overall serviceability of our road system.

However, even though we can't alter the road system so much as to be fully affordable and sustainable within today's budget levels, we can certainly take steps to move it in a better direction. By utilizing the opportunities identified from the Rogue River - Siskiyou NF Travel Analysis Process, we can certainly move the Rogue River – Siskiyou NF road system to a much more affordable and sustainable state.

This travel analysis report will be posted on the Rogue River-Siskiyou National Forest website. http://www.fs.usda.gov/detail/rogue-siskiyou/landmanagement/resourcemanagement/?cid=stelprd3804323

Travel analysis is considered a living document and will continue to be revised as needed. It is a part of the Rogue River-Siskiyou National Forest public road atlas. This travel analysis is not a NEPA analysis with an action proposal resulting in a decision. Future project level road actions with road-specific decisions will require additional public scoping and involvement.

Appendix

Appendix A: System Roads Spreadsheets (2) Spreadsheets
Appendix B: Vicinity Map
Appendix C: Existing Road System, ML 4 Maps
Appendix D: Road Management Opportunities, ML 4 Maps (and zip file)
Appendix E: Risk/Benefit Road System, 4 Maps (and zip file)
Appendix F: R6 TAP Task List, (Travel Analysis Process) and Directions (2 documents)
Appendix G: Financial Analysis (6 documents)
Appendix H: Travel Management Public Scoping (5 documents)
Appendix I: WO Directions (5 documents)
Appendix J: R-S Forest Directions (1 document)
Appendix K: Resource Benefit Risk Evaluation Descriptions (8 documents)
Appendix L: Glossary (2 documents)
Appendix M: Roads Analysis Process Summary

Literature Cited

USDA Forest Service. 1999. Roads Analysis: Informing decisions about managing the National Forest Transportation System. Misc. Rep. FS-643. Washington, D.C.: U.S. Dept. of Agriculture Forest Service. 222 pp.

USDA Forest Service Handbook, National Headquarters, WO, Washington DC, FSH 7709.55 Travel Planning Handbook (Amended 01-08-2009)

USDA Forest Service Infrastructure Application, Travel Routes Data Dictionary and Business Rules for Roads, July 2013

USDA Forest Service, Pacific Northwest Region, Land and Resource Management Plan, Rogue River National Forest 1990

USDA Forest Service, Pacific Northwest Region, Land and Resource Management Plan, Siskiyou National Forest 1989

http://www.fs.usda.gov/detail/rogue-siskiyou/landmanagement/?cid=stelprdb5315100

(http://www.fs.usda.gov/Internet/FSE_DOCUMENTS/stelprdb5369047.pdf).

USDA Forest Service, USDI Bureau of Land Management, Northwest Forest Plan ROD 1994

USDA Forest Service, Transportation Atlas Records and Analysis 7712.13b

USDA, Forest Service, 36 CFR Parts 212, 251, 261, and 295, RIN 0596–AC11, Travel Management Final Rule, Travel Management; Designated Routes and Areas for Motor Vehicle Use (2005)

USDA, Forest Service, 36 CFR Parts 212, 261, and 295, RIN 0596–AB67,Administration of the Forest Development Transportation System; Prohibitions; Use of Motor Vehicles Off Forest Service Roads (2001)

http://www.fs.usda.gov/detail/rogue-siskiyou/home/?cid=STELPRDB5316594