



United States  
Department of Agriculture  
**Forest Service**

**Umpqua National Forest**  
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# Umpqua National Forest

## **Road Analysis Report**

Analysis: Forest-Scale

June 19, 2003

**ROAD ANALYSIS REPORT  
TABLE OF CONTENTS**

**EXECUTIVE SUMMARY ..... 4**

**CHAPTER 1: INTRODUCTION ..... 6**

**BACKGROUND ..... 6**

**SCALE ..... 6**

**THE ANALYSIS PROCESS..... 7**

**PUBLIC INPUT ..... 7**

**CHAPTER 2: DESCRIBING THE SITUATION ..... 8**

**EXISTING ROAD SYSTEM DESCRIPTION ..... 8**

    Table 1. Road miles on Current Road Inventory (INFRA 2003)..... 9

    Table 2. Comparison of the Forest transportation system..... 10

**ABILITY OF THE ROAD SYSTEM TO MEET OBJECTIVES ..... 11**

**CHAPTER 3: ISSUE ANALYSIS..... 12**

**ECONOMIC ISSUES..... 12**

    Table 3. Road maintenance cost comparison. .... 13

    Table 4. Summary of Roads Affected by 2002 Umpqua Fires..... 16

**ACCESS ISSUES ..... 17**

    Table 5. Umpqua National Forest developed recreation capacity ..... 22

    Table 6. Umpqua National Forest annual recreation use estimate, FY 2001 ... 23

    Table 7. Umpqua NF activity participation and primary activity, FY 2001 ..... 24

**AQUATIC ISSUES..... 35**

**Terrestrial ISSUES ..... 42**

**REFERENCES ..... 47**

**GLOSSARY ..... 49**

**INDEX OF APPENDICES**

**APPENDIX A - ROADS ANALYSIS PROCESS, STEP 4 AND KEY QUESTIONS**

**APPENDIX B - PARTICIPATION AND PUBLIC INPUT**

**APPENDIX C - ROAD MANAGEMENT INFORMATION****APPENDIX D - KEY RECOMMENDATIONS****APPENDIX E - CRITERIA FOR KEY FOREST ROADS****APPENDIX F - AQUATIC INFORMATION****APPENDIX G - TERRESTRIAL INFORMATION****APPENDIX H - INVENTORIES AND ASSESSMENT PROTOCOLS****MAPS (PDF FILES)**

- Key Forest Roads – Tiller Ranger District
- Key Forest Roads – Cottage Grove Ranger District
- Key Forest Roads – North Umpqua Ranger District
- Key Forest Roads – Diamond Lake Ranger District
- Potential Forest Service Public Roads
- Forest Map of Primary and Secondary Roads and Road Density

## EXECUTIVE SUMMARY

The management direction for Umpqua National Forest has undergone dramatic change during the last 15 years. With the publication of the Forest Land and Resource Management Plan in 1990, the Forest went from a program of intensive timber management providing an annual timber harvest of about 365 million board feet, to a program with a harvest of 333 million board feet. And with the implementation of the Northwest Forest Plan in 1994 and the listing of Coho salmon as threatened, the annual probable sale quantity (PSQ) for timber harvest dropped to 70 million board feet per year. Nearly all Umpqua National Forest System roads had been developed by the late 1980s.

In 1994 the Forest completed a two-year process with the issuance and approval of an Access and Travel Management (ATM) Plan. In 1996 the ATM Plan was updated to identify the primary and secondary road system essential for public access and travel throughout the Forest. This was done to match road maintenance budgets with the priorities and standards for road maintenance. This process was finalized in 1998. The primary and secondary road system comprises about 34% (1,610 miles) of the National Forest System roads. Of the remaining 66% (3,200 miles) of the system, 1,230 miles (25%) are closed system roads. Roads that are not included in the primary and secondary system, and not closed, were placed in an "Other" category and intended only to receive maintenance necessary for critical safety and resource protection.

Due to reduction in appropriated funds and the continued reduced timber harvest, the Forest currently receives only 83% of the funds needed to maintain all the primary and secondary roads to standard. The current deferred maintenance backlog is estimated to be more than \$46 million.

The storms of the winters of 1996-99 caused landslides, floods, and debris torrents. Flood peaks that year were the largest on the Umpqua since the record year of 1964. The Umpqua had a historic fire season in 2002 that brought additional damages to the road system. These events have caused over \$11 million in damage to the Forest road system.

Watershed analyses have been completed the Umpqua. All of these analyses have recognized the significance of roads and their effects on the environment and many have made recommendations regarding specific roads and their future management.

This roads analysis is not a decision, but rather a compilation of information useful for making informed decisions about road management<sup>1</sup>. It has three primary objectives. First, to take a look at the key roads (the primary and secondary road system) and validate this concept as a tool for making decisions about road management. Second, to capture the accumulated information that we've gained from public involvement and compiling Ranger District input in order to better inform land managers about the benefits and liabilities of roads, indicate some areas needing improvement in road management, ways to mitigate risks, and sources of additional information. Third, to

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<sup>1</sup> USDA Forest Service. 2001d. Forest Service Manual 7700: Transportation System, WO Amendment. 7712: Authority for Transportation Analysis, 1/12/2001.

provide guidance for watershed scale and project scale roads analysis.

To accomplish this task a Forest team used the Forest Service publication Roads Analysis: Informing Decisions About Managing the National Forest Transportation System<sup>2</sup>. The team followed the six-step process outlined in this document and used its list of 73 Ecological, Economic and Social considerations in order to identify issues specific to the Umpqua. The team found that many of the road system issues are best addressed at the watershed or project scale rather than the Forest scale. Other potential considerations were determined not to be relevant to making road decisions for the Umpqua. The answers for the Key Questions are a combination of District, public comment, the Roads Analysis team, and the Forest Executive Team responses, as listed in Appendix A: Roads Analysis Process, Step 4 and Key Questions. In all, four issue groupings were found to be important for informing road decisions for the Umpqua:

- Economic - **Low maintenance funding and our ability to maintain key access routes.**
- Access - **People depend on Forest roads for safe travel and Forest access. Access is critical for creating desired forest characteristics through vegetation management, for fire suppression, recreation, mineral access, and private inholdings.**
- Aquatics - **Roads influence hydrology, streams, water quality, and amphibians and fish habitat and passage.**
- Terrestrial - **Roads affect wildlife through fragmentation and disturbance. Roads and people can increase the spread of non-native plant and animal species.**

Each of these issue areas is discussed in detail in Chapter 3, Issues (pages 11-41). Each issue has a discussion of the current situation, risks and benefits, desired future conditions, and recommendations. In addition, the analysis includes a map of the current key road system and lists roads and maintenance objectives for the rest of the system in Appendix C: Road Management Information. This roads analysis captures what we know to be important today. If changes are needed, adjustments or modifications to the primary and secondary road system can be addressed at the appropriate scale.

The recommendations of this report will provide forest managers with the tools that allow wise choices regarding road management in the future.

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<sup>2</sup> USDA, Forest Service. 1999. Roads Analysis: Informing Decisions about Managing the National Forest Transportation System, Washington Office. FS-643.

# CHAPTER 1: INTRODUCTION

## BACKGROUND

On January 12, 2001, the Forest Service issued the final National Forest System Road Management Rule<sup>3,4</sup>. This rule revised regulations concerning the management, use, and maintenance of the National Forest Transportation System. This final rule ensured that additions to the National Forest System road network were essential for resource management and use; that construction, reconstruction, and maintenance of roads minimized adverse environmental impacts; and that unneeded roads were decommissioned and restoration of ecological processes initiated.

In 1994 the Forest completed a two-year process with the issuance and approval of an Access and Travel Management Plan (ATM) as directed by Regional Forester John Lowe<sup>5</sup> and the 1990 Umpqua Land and Resource Management Plan<sup>6</sup> (LRMP). The ATM Plan is a tool that can be used by District Rangers, resource managers, and road managers to implement the Forest Plan direction related to access and travel management.

In 1996 the ATM Plan was updated to identify the basic primary and secondary road system considered essential for public access and travel throughout the Forest. The intent was to provide priorities and standards for road maintenance that would match expected road maintenance budgets. The process was finalized in 1998. The primary and secondary road system comprises about 34% (1,610 miles) of the total National Forest System roads on the Umpqua. Of the remaining 66% (3,200 miles), 1,230 miles (25%) are closed roads. Roads that are not included in the primary and secondary system, and are not closed roads, have been placed in an “Other” category and are to only receive maintenance necessary for safety and resource protection.

Due to the reduction in appropriated funds and the continued reduced timber harvest, the Forest is not able to maintain even the primary and secondary roads to standard. Currently the Forest receives only 83% of the funds needed to maintain the primary and secondary roads to standard. Each year the deferred maintenance backlog grows and is currently estimated at more than \$46 million.

## SCALE

Roads analysis may be done at any of three scales:

1. **Large scale assessments** analyzed at the province, multi-Forest or eco-region scale. This scale focuses on broad regional issues, coordination with State,

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<sup>3</sup> USDA Forest Service. 2001a. Forest Service Manual 7700: Transportation System, WO Amendment. 7701.3-2001-1: Transportation System Management, 1/12/2001.

<sup>4</sup> USDA Forest Service. 2001c. Forest Service Manual 7700: Transportation System, WO Amendment. 7710: Transportation Atlas, Records, and Analysis, 1/12/2001.

<sup>5</sup> Reference 1920 / 7710 letters dated January 4 and February 6, 1991. Filed at Umpqua National Forest office: Roseburg, OR.

<sup>6</sup> USDA Forest Service. 1990b. Umpqua National Forest Land And Resource Management Plan. Umpqua National Forest: Roseburg, OR, Appendix F.

county, local and tribal transportation systems and addresses needs for new or revised Forest highways, public lands highways, and public Forest Service Roads.

2. **Forest or Area Scale**, including an inventory of all classified roads; identification of key issues, concerns, and opportunities; and guidelines for addressing road construction, reconstruction, maintenance, and decommissioning.
3. **Watershed or Project Scale**, including identification of needed and unneeded roads, site-specific opportunities, priorities and opportunities for road improvements and decommissioning and identification of areas with special sensitivity or unique values.

Guidance on selecting the appropriate scale and those proposed actions which may trigger a need for a roads analysis is set forth in Forest Service Manual 7712.1. Road analysis at the watershed or project scale is needed prior to decisions on “new road construction”, “road decommissioning”, and “road reconstruction”<sup>7,8</sup>. Road analysis is not needed prior to decisions regarding “road maintenance.”

Another element of scale is time. This roads analysis will serve as a transition document before the Forest Plan is scheduled for completion in 2010.

## THE ANALYSIS PROCESS

A Forest team composed of resource and technical specialists conducted the Umpqua Roads Analysis following the Forest Service publication FS-643, Roads Analysis: Informing Decisions About Managing the National Forest Transportation System (USDA 1999) for conducting the analysis (Appendix A: Roads Analysis Process, Step 4 and Key Questions).

## PUBLIC INPUT

The public was invited to contribute comments on road management for the Umpqua. A press release was issued and individual letters were mailed to interested parties on the Forest mailing list announcing an Open House in Roseburg on June 17, 2002. Individuals who were unable to attend telephoned in or emailed their comments. Some organizations also unable to attend the Open House were directly contacted for their input. The process used for public outreach and the comments received are listed in Appendix B: Setting Up The Analysis.

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<sup>7</sup> USDA Forest Service. 2001b. Forest Service Manual 7700: Transportation System, WO Amendment. 7703: Policy for Transportation System, 1/12/2001.

<sup>8</sup> USDA Forest Service. 2001d. Forest Service Manual 7700: Transportation System, WO Amendment. 7712: Authority for Transportation Analysis, 1/12/2001.

## CHAPTER 2: DESCRIBING THE SITUATION

### EXISTING ROAD SYSTEM DESCRIPTION

The Umpqua National Forest has about 4,930 miles of roadway and approximately 110 miles of state and county roads, and about 60 miles of private roads, within its boundaries.

Historically, the Umpqua National Forest emphasized access for timber management and recreation. Prior to the Umpqua Land and Resource Management Plan<sup>9</sup>, the Forest was harvesting about 365 million board feet per year with continual use and growth of the road network. However, the Northwest Forest Plan<sup>10,11</sup> amended the Umpqua Forest Plan and radically changed management direction on the Forest with the programmed timber harvest declining dramatically to 70 million board feet per year. Instead of large areas of general forest land allocations as planned in the Umpqua LRMP 1990, the Northwest Forest Plan allocations significantly changed in 1994. Reference Appendix C: Road Management Information for table of historic actual timber harvest. In Late Successional and Riparian Reserves, timber harvest is largely a by-product of efforts to restore late-successional or “old growth” stand characteristics, while in Matrix lands and Adaptive Management Areas timber production is the primary focus.

An indirect effect of this harvest reduction was a drastic reduction in the Forest’s ability to maintain roads. Traditionally, timber sale purchasers performed local road maintenance and deposited funds towards co-operative road maintenance. Prior to 1990, about two-thirds of the road maintenance on the Umpqua was accomplished through timber sales, with the remaining from appropriated funding. The reduction in timber harvest meant there would be insufficient funds to maintain all the roads in service. Appropriated road maintenance funds have not increased since the early 1990s, and in fact have decreased in recent years. Without maintenance, roads erode and become unsafe for travel.

Safe access is still needed for forest products, recreation, and resource protection. Only a limited number of roads can be maintained to standard and many other roads may need to be closed or stabilized to minimize maintenance requirements and negative impacts to water quality and other resources as well.

The intent of the District ATM Plans was to wisely allocate limited funds to the highest priority roads first. Primary Roads would get highest priority for funding followed by Secondary Roads and then “Other” roads.

The **Primary Roads** will handle much of Forest visitor and public travel needs. These roads are maintained for passenger cars and are the first priority for road maintenance. These

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<sup>9</sup> USDA Forest Service. 1990. Umpqua National Forest Land and Resource Management Plan. Umpqua National Forest: Roseburg, Oregon.

<sup>10</sup> USDA Forest Service and USDI Bureau of Land Management. 1994a. Record of Decision for Amendments to Forest Service and Bureau of Land Management Planning Documents within the Range of the Northern Spotted Owl.

<sup>11</sup> USDA Forest Service and USDI Bureau of Land Management. 1994b. Final Supplemental Environmental Impact Statement on Management of Habitat for Late-Successional and Old Growth Forest Related Species Within the Range of the Northern Spotted Owl.

roads are the "backbone" of the National Forest System roads. They are arterial and major collector roads.

**Secondary Roads** form the remainder of the Key Road System. They allow access to the much of the rest of the Forest, specifically to trailheads, project sites, special use areas, and private lands. These roads are minor collector roads and some high use lateral roads. Currently the secondary roads are only maintained for high clearance vehicles, but those roads that are intended to be used by passenger cars may be maintained at that level in the future.

Passenger cars will be able to easily travel over low clearance roads (Primary Roads), whereas vehicles like trucks will be recommended for high clearance roads, especially during rainy periods.

The initial ATM Plan was completed in March 1994 and documented access and travel management decisions for roads, trails, and off-road vehicle areas. Since that time new issues have surfaced, primarily due to changes in land allocations brought about by the Northwest Forest Plan. Appendix C: Road Management Information contains the Ranger Districts' Access and Travel Management Plan. Appendix C also contains some frequently asked questions covering the revision of the ATM Plan. Table 1 displays Access and Travel Management road mile totals.

TABLE 1. ROAD MILES ON CURRENT ROAD INVENTORY (INFRA 2003).

<b>RANGER DISTRICT</b>	<b>PRIMARY MAINTENANCE ROAD MILES</b> (Low clearance/ passenger car)	<b>SECONDARY MAINTENANCE ROAD MILES</b> (High Clearance)	<b>OPEN "OTHER" ROAD MILES</b>	<b>CLOSED ROAD MILES</b> (Level 1)	<b>TOTAL ROAD MILES</b>
<b>Cottage Grove</b>	69	133	163	112	476
<b>Tiller</b>	192	436	749	395	1,772
<b>Diamond Lake</b>	160	162	395	445	1,161
<b>North Umpqua</b>	113	343	665	275	1,396
<b>TOTALS</b>	534	1,074	1,973	1,225	4,806

Primary and Secondary Roads need to be evaluated at the Forest and Regional scale and all other roads at the watershed or project scale to determine whether they should remain in the National Forest System as open roads, intermittent use roads (with continual access not maintained for public travel), or are unneeded and should be planned for decommission and removed from the system<sup>12</sup>.

The total miles of road in the road inventory has fluctuated since the establishment of the 1994 Access and Travel Management Plan. The total has decreased due to road

<sup>12</sup> 36 CFR 212.

decommissioning, but has increased because of the addition of formerly unclassified roads to the road system inventory.

Since 1996 there have been 114 miles of roads decommissioned. These roads have received a variety of treatments to stabilize them, restore hydrologic function, and remove the road from the Forest System road network. Decommissioned roads were those presenting a high risk of resource damage and not needed for access.

There are roads on the Umpqua that are not included in the inventory, either by design or by omission. The inventory does not include temporary project roads that are scheduled to be eliminated at the end of the project. In addition, there were roads that should have been put on the inventory, but were not inventoried. These include temporary roads that were never eliminated and roads whose construction was never recorded. As these types of roads are discovered, they will be entered as “unclassified” (as per FSM 7705) until their need is assessed. If they are needed for Forest management they will be added to the inventory as National Forest System roads or roads under other jurisdictions. If they are not needed, they will be put in the category of “to be decommissioned”.

**TABLE 2. COMPARISON OF THE FOREST TRANSPORTATION SYSTEM.**

<b>DATA YEAR</b>	<b>TOTAL MILES SYSTEM ROADS</b>	<b>KEY PRIMARY MILES LOW CLEARANCE<sup>1</sup></b>	<b>KEY SECONDARY MILES HIGH CLEARANCE<sup>2</sup></b>	<b>TOTAL MILES MAINTAINED TO STANDARD<sup>3</sup></b>
<b>1990</b>	4,731	1,144	N/A	3,704
<b>1994 District ATM Plan<sup>3</sup></b>	4,888	1,225	N/A	3,304
<b>1998 District ATM Plan Updated</b>	4,899	522	1,143	2,291
<b>Current Status 2002<sup>4</sup></b>	4,806	534	1,074	1,320

<sup>1</sup> Suitable for passenger car travel; maintenance levels 3 to 5.  
<sup>2</sup> Suitable for standard pick-up truck travel; maintenance level 2.  
<sup>3</sup> 1994 Access & Travel Management Plan (3/1994).  
<sup>4</sup> Most recent year that data is available.

Watershed analyses have been completed for nearly the entire Umpqua, with the Upper South Umpqua to be completed this year. All of these analyses have recognized the significance of roads and their impact on the environment and many have made recommendations regarding specific roads and their future management. Some roads have been decommissioned or otherwise hydrologically stabilized and closed to traffic as a result of these analyses. See Appendix F: Aquatic Information for a map of the watersheds and a table of watershed analyses.

Today, the Umpqua is committed to terrestrial and aquatic restoration while considering the role, importance, and interdependency of access. Due to declining road budgets, some roads may be closed, placed in a lower maintenance level, or decommissioned.

**ABILITY OF THE ROAD SYSTEM TO MEET OBJECTIVES**

The Umpqua foresees a smaller road system that will still allow safe travel across the Forest and provide reasonable access to major recreation opportunities, resource management activities, and private lands within the Forest boundary.

The process of selecting and managing the network of key Forest roads is intended to be responsive to issues and needs. To achieve this, the selection criteria for Primary and Secondary Roads should be reviewed, modified, and adapted on an “as needed” basis in response to changing budgets and Forest management goals and objectives.

**ROAD SYSTEM RIGHTS-OF-WAY-ACQUISITION NEEDS**

As part of this Forest Scale Roads Analysis, rights-of-way needs for National Forest System roads on the Umpqua National Forest were identified. The results of this analysis, including maps, are available upon request from the Forest Road Manager and Forest Lands Program Manager.

## CHAPTER 3: ISSUE ANALYSIS

This section analyzes key issues regarding forest roads, the current situation pertaining to the issue, and the risks and benefits of action or no action. Recommendations given are to help resolve issues and manage conflicts and are to be adopted and implemented as time and funding allows.

### ECONOMIC ISSUES

- ❖ **ISSUE: The Forest is not able to fund all road maintenance needed to keep the current Forest Service road system maintained to standard.**

#### CURRENT SITUATION

As management direction changed from an emphasis on timber products to protection of wildlife and fish habitat, the Forest has recognized that the existing road system would quickly become a liability to resources if not properly maintained.

Prior to 1994, about one-third of the Forest road budget came from congressionally appropriated funds, with the remainder from cooperative deposits associated with timber sales and direct timber purchaser performance. The reduction in timber sales also caused an almost immediate halt in new road construction and reduced the ability to use timber-generated funds for reconstruction and restoration of the existing system. The budgets in subsequent years have continued to decline leading to reduced maintenance and a need to prioritize the distribution of available maintenance funds to the key road system.

Current and foreseeable budget allocations do not provide adequate funding to maintain even the Primary and Secondary Roads to established standards. Deferred maintenance has risen to more than \$46 million. More significantly, needed repairs of failing road surfaces, failing cut and fill slopes, major resurfacing, repair of landslides, and signing have been deferred. Periodic surveys of the deferred maintenance are being done to track real needs.

In Fiscal Year 2002 about 27% of the Forest road system was maintained to standard compared to about 75% in Fiscal Year 1990.

The Fiscal Year 2003 budget allocation for road management and maintenance from appropriated (CMRD) and collection (CWFS) is \$1.15 million (including pool and program management costs). This total includes \$790,000 related to road maintenance activities. Additionally, \$336,000 of road maintenance work is funded in Fiscal Year 2003 from "Secure Rural Schools and Communities Self-Determination Act of 2000" funds (PAYCO). The appropriated road maintenance funds are expected to decrease by about 15% between Fiscal Year 2003 and 2006.

Table 3 summarizes the cost to maintain and manage the current road system to standards, and the deferred maintenance costs of repairs since the shift in Forest management and funding of the road system. Annual maintenance costs were calculated for paved and

gravel roads by cost per mile then totaled for the key and non-key system roads. Deferred maintenance costs are based on road surveys from 1999.

**TABLE 3. ROAD MAINTENANCE COST COMPARISON.**

ROAD SYSTEM	MILES	ANNUAL MAINTENANCE COST (FULL COST) <sup>1</sup>	DEFERRED MAINTENANCE COST <sup>2</sup>
<b>Key Roads</b>	1,608	\$471,981	\$4,232,970
<b>Non-Key Roads</b>	3,198	\$692,127 (not currently being maintained)	\$42,244,670
<b>Total</b>	4,806	\$1,164,108 (If all miles maintained to standard.)	\$46,477,640

<sup>1</sup> Full cost includes both custodial maintenance and periodic surfacing replacement. Does not include drainage structure replacements.

<sup>2</sup> Deferred Maintenance includes deficiencies identified by field surveys (1999) in accordance with national road standards protocol.

## RISKS AND BENEFITS

Most of the potential effects by roads are difficult to measure quantitatively because there is a lack of site-specific data, and the direct relationship between road miles and service effects is not well understood.

Potential risks associated with reduced or limited road maintenance are decreased user safety and increased resource damage. Less ditch line and culvert maintenance increases the likelihood of damage to road surfaces and streams. Deferred maintenance on road segments that have deteriorated over time contributes to unsafe use of the roads (reduced visibility by encroaching brush and rough road surfacing) and potential for catastrophic damage resulting from storm events.

The benefits of prioritizing limited maintenance funding is that available funds can be used on the areas of highest public road use and locations that have a higher risk of road system and environmental damage. Documenting maintenance shortfalls and inventorying long-term needs helps prioritize projects where needs exceed funding sources.

## RECOMMENDATIONS

- Use the key road system (Primary and Secondary Roads) as a basis for making site-specific road management decisions. If needed, adjust the system to meet changing needs and conditions over time.
- Inventory annual and deferred maintenance needs of the key road system. Inventory ¼ of roads maintained for public travel each year. Track site-specific accomplishments and needs as well as watershed analyses recommendations for roads in a database available to Forest Restoration decision-makers.
- Prioritize road maintenance work to ensure resource protection and user safety within current Forest budgets. Develop a Forest-wide strategy for long-range road maintenance.

- Balance long-term road maintenance costs with short-term investments to prevent road and resource damage.
- Develop annual road maintenance plans based on road management objectives, expected traffic, available funding, and Forest priorities.
- Consider alternative funding sources for road maintenance and repair. Examples may include:
  - ✓ Cooperative partnership funding and grants for improvements to the key road system resulting in improvements to fish and aquatic habitat.
  - ✓ Partnerships and agreements with other road management agencies, local private landowners and commercial road users.
  - ✓ Special Use and Road Use Permits for the maintenance of project roads during periods of use by non-Forest Service users. Permits identify maintenance to be performed by permittees commensurate with use.
  - ✓ “Secure Rural Schools and Communities Self-Determination Act of 2000” (PAYCO).

**❖ ISSUE: Over \$25.5 million in high priority road-related watershed restoration needs have been identified in the Umpqua National Forest Watershed Restoration Business Plan. Funding for this work is limited.**

## CURRENT SITUATION

In August of 2000 the Umpqua completed the “Umpqua National Forest Watershed Restoration Business Plan.”<sup>13</sup> This plan identified watershed restoration goals for the Forest and established a watershed restoration strategy, including a prioritization of watersheds and subwatersheds for restoration work. This plan was updated in 2003.

The 10-year restoration strategy for the Umpqua (FY2000-2010) indicates a need for road reduction, road improvements, road revegetation, and noxious weed control along roadsides, as well as prescribed burning, pre-commercial thinning, and instream habitat improvements. Road improvements may include culvert upgrades, construction of water bars and drain dips, sidecast fill pullback, landslide stabilization, and other stormproofing. Steamboat Creek, Middle South Umpqua and Upper South Umpqua, Middle North Umpqua, Jackson Creek, Little River, and Upper Row are all high priority watersheds for road-related restoration work.

Since 1994, watershed restoration, and other, efforts have resulted in the decommissioning of 114 miles of road, 26 miles of which has occurred in the Steamboat Creek watershed. This represents 42% of the roads identified for decommissioning in the Steamboat Creek watershed, and 40% of the 10 year decommissioning goal for the

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<sup>13</sup> USDA Forest Service. 2003c. Watershed Restoration Business Plan, 2003 Update. March 2003. Umpqua National Forest: Roseburg, Oregon.

Forest. Additionally, 214 miles of road Forest-wide have been stormproofed or improved to reduce mass wasting and erosion concerns.

Road decommissioning costs are fairly expensive on a per mile basis. Direct decommissioning costs, including planning and engineering, range from \$15,000 to \$50,000 or more per mile. Road watershed improvement costs range from \$10,000 to \$35,000 per mile plus the cost of annual maintenance.

In Fiscal Year 2002, appropriated road funds (CMRD) of \$335,000 (including cost pools) was budgeted for road related watershed restoration work. This funding has represented about 15% of the Forest Service road funds allocated to the Umpqua. Some of this work was, however, deferred as a result of the program borrowing money from such projects to help cover national wildfire suppression costs. Additionally, there was \$596,000 (including cost pools) in funding approved in Fiscal Year 2002 for road related restoration projects from the "Secure Rural Schools and Community Self-Determination Act of 2000" program (PAYCO). There were additional restoration funding opportunities in Fiscal Year 2002 from grants from other partners and organizations.

Some watershed restoration funding opportunities exist through timber sale CWKV-Other collections for work within sales areas in Matrix allocation lands of Key Watersheds, as well as in the Little River Adaptive Management Area. There presently is several hundred thousands of dollars of CWKV funds planned and collected for road restoration work on the Umpqua. This work will be accomplished within the next two to four years.

## **RISKS AND BENEFITS**

The Umpqua N.F. Watershed Restoration Business Plan strategy focuses restoration efforts on the highest priority watersheds on the Forest. A large portion of the Forest is considered moderate or low priority for restoration according to the Business Plan and funding needed to accomplish road improvements to benefit other resources, as well as providing for road user safety, will be directed elsewhere. High priority road related restoration and maintenance funding is inadequate to meet all needs in a timely manner and puts both human safety and resources at risk. The backlog of needs grows each year.

The Fiscal Year 2005 USDA Forest Service "Performance Management Plan" includes as one of the top priority management objectives the following: "Strategic Objective 1a – Improve and protect watershed conditions to provide the water quality and quantity and soil productivity necessary to support ecological functions and intended beneficial water uses."

A considerable amount of road related restoration work remains on the Umpqua to meet the 10-year goals established in the 2000 Watershed Restoration Business Plan (revised 2003).

Forest Service appropriated road funds to the Pacific Northwest Region are declining and are expected to decline even further in the next few years. This trend is expected to continue on in the future. The Fiscal Year 2005 BFES program level (CMRD) for the Umpqua for road decommissioning and road related watershed improvements is \$200,000. With the declining Forest Service funds, partnership and PAYCO funding will have increased importance in being successful in accomplishing road related watershed restoration. Restoration opportunities also exist through the timber sale program.

## RECOMMENDATIONS

- Integrate the Forest restoration program with the Engineering program to ensure the Forest restoration strategy is understood and implemented for all road related activities.
- Continue to implement the 2000 “Umpqua National Forest Watershed Restoration Business Plan” as revised (2003), within available funding constraints. Continue to follow the priorities from this plan in accomplishing road related watershed restoration work.
- Actively explore partnership and PAYCO funding opportunities to accomplish restoration objectives.

❖ **ISSUE: An estimated \$1.173 million in damage to the Forest road system occurred as a result of the 2002 wildfires.**

## CURRENT SITUATION

A total of 420 miles of National Forest System roads are located within the boundaries of the 2002 Umpqua fires. Of this, about 96 miles, or 23% of the total, exist within areas of moderate to high burn intensity. Another 57% (239 miles) are in unburned areas within the fire boundaries, with the remainder (85 miles) in areas of low burn intensity. Table 4 displays a summary of the roads affected by each fire area. A typical road within the burned areas is a single-lane road with turnouts, gravel surfaced, and uses ditches and culverts for drainage.

TABLE 4. SUMMARY OF ROADS AFFECTED BY 2002 UMPQUA FIRES<sup>14</sup>.

Fire Area	Total Road Miles within Fire Area	Road Miles within High Intensity Burn Areas	Estimated Stream Crossing Culverts Needing Upgrade	Estimated Other Culverts Needing Replacement/ Installation	Estimated Road Signs Needing Repair/ Replacement
Tiller Complex	332	72	33	30	230
Apple Fire	88	24	27	25	70
<b>Totals</b>	420	96	60	55	300

<sup>14</sup> USDA Forest Service. 2003a. Umpqua National Forest Wildfire Effects Evaluation Project. (WEEP) Umpqua National Forest: Roseburg, Oregon.

Approximately \$915,000 of emergency road related work was funded from the Burned Area Emergency Rehab (BAER) program for the 2002 fires. Initial high priority post-BAER fire restoration and maintenance work of \$258,000 has been funded (CMRD) in Fiscal Year 2003.

## **RISKS AND BENEFITS**

The most prevalent types of damage to the roads that needs immediate attention includes:

- burnt trees falling into the roadway or trees with a hazard of falling on the roadway during the next one to five years, and therefore needing to be removed now;
- woody debris located in road fills which having burnt is causing the unsupported fill to collapse;
- burn holes within the road fills which initially retain the shape of the buried stump or log presenting a hazard of collapse under vehicle or foot traffic;
- road ditch lines and culvert inlets plugged from falling trees, rocks and small landslides;
- damage or destruction of road signs, milepost markers, and hazard delineators;
- and in at least one case, direct impact damage to a culvert inlet from a falling tree.

As a result of the fires, roads will remain at an elevated risk for culvert plugging and stream channel crossing failure due to increases in peak runoff flows, increased channel and slope erosion, increased debris transport within stream channels, and an increased rate of landslides; general landform slopes are being referred to here – culvert and road fill failures in the high and moderate burn intensity landscape will also likely be greater, particularly in areas of steep slopes and high tree mortality due to the lack of large rooted vegetation to slow or stop storm runoff, and small to moderate slope and road fill failures. The peak increase in risk of slope failures following an intense fire is expected to occur during the first three years following the event, depending on the extent of subsurface root structure remaining. The weakened slope condition will persist for another 10 to 20 years until sufficiently large vegetation is re-established and again reinforces the generally thin soils on these slopes.

## **RECOMMENDATIONS**

- Update priorities for fire restoration road work as additional funding may become available.
- Plan for high intensity storm patrols within fire perimeters during the next five years.

## **ACCESS ISSUES**

Significant comments regarding the need to maintain Forest access for all forest users were received during the Team's involvement with the public and Districts.

The Access and Travel Management analysis recognized that people and local communities depend on some Forest roads more than others. The Primary and Secondary Roads are the key or priority roads that connect public roads, provide access to communities, connect land in other ownership, are important tribal use areas, and are first to receive funding to address the safety of road users.

As maintenance budgets continue to decrease, there is a risk that road safety deficiencies will increase over time. Roadside hazards may not be immediately identified and responded to in a timely manner.

The benefit of identifying and managing road access is that it prioritizes funding to those roads most important to the forest users and puts a premium on maintaining roads that may harm resources if not regularly maintained. The map of key Forest roads (Appendix C: Road Management Information) displays the priority road network.

**❖ ISSUE: Forest roads are important to access cooperative data collection sites, utility corridors, the North Umpqua Hydroelectric Project and special use sites.**

### **CURRENT SITUATION**

Roads are needed to access cooperative data collection sites, utility corridors, the North Umpqua Hydropower Project, and special use sites. This includes access to telecommunication sites. Road maintenance is very important to the timely maintenance of utility lines and systems.

An extensive network of roads (approximately 200 miles) and bridges provides access to the North Umpqua Hydroelectric Project facilities and transmission lines, and Project related recreation facilities. These roads provide access between State Highway 138 and the Project facilities and within the Project area. Most of these roads were initially constructed in the 1950's and early 1960's. Many of the major access routes were reconstructed and improved by the USDA Forest Service between 1970 and 1995.

PacifiCorp has constructed, operates and maintains certain roads and bridges located within the existing Project boundary on National Forest lands. These are referred to as PacifiCorp-Maintained Hydro Roads. These roads are essentially exclusive use roads by PacifiCorp and USDA FS administrative traffic. They have little or no public or other use. However, most of these roads are not blocked or closed to other road users. Under the current FERC Hydropower License, PacifiCorp has been responsible for all maintenance of these roads. However, there has not been an agreed to or established set of standards for this maintenance work.

There are presently 51 road bridges located on roads on National Forest lands that access the Project. There are an additional six road bridges located within the Project boundary, which the current use or maintenance responsibility is uncertain. The USDA Forest Service constructed and presently maintains 13 of the road bridges that access the Project. The average age of these bridges is 26 years. PacifiCorp constructed and presently maintains 38 bridges that access the Project. The average age of these bridges is 39 years with most of these bridges being constructed in the 1950's and early 1960's.

The Project will require continued road access by PacifiCorp to operate and maintain Project facilities over the term of the new license during the next 35 years.

In June of 2001 the Forest Service, PacifiCorp signed a “Settlement Agreement “Concerning the Relicensing of the North Umpqua Hydroelectric Project” (SA). This SA provides legal requirements for instituting cost-sharing mechanisms between the USDA Forest Service and PacifiCorp, allocating responsibility for maintenance activities between these parties, and establishing appropriate S&G for insuring construction and maintenance activities are conducted to minimize impacts to surrounding natural resources. The SA required the development of a Transportation Management Plan (TMP) for the Project.

The cost of maintenance and improvements will be jointly shared between the USDA FS and PacifiCorp, commensurate with the use by each party, with the USDA FS responsible for any use by third parties, except for Project related recreation traffic.

## **RISKS AND BENEFITS**

The cost of maintenance and improvements of National Forest System roads and bridges are shared by commercial users of these facilities with the Forest Service (36 CFC 212). The costs are jointly shared commensurate with the use by each party, with the USDA FS responsible for any recreation and Forest Service administrative traffic, except for Hydropower Project related recreation traffic.

Recent inspections of roads and bridges accessing North Umpqua Hydropower Project indicate that several of the roads and bridges have deferred or backlog maintenance needs. Implementation of the Hydroelectric SA and TMP measures will maintain public safety and reduce soil erosion and sediment delivery to stream habitat.

As maintenance budgets continue to decrease, there is a risk that road deficiencies will increase over time. Roadside hazards that could eventually create access problems may not be immediately identified and responded to in a timely manner until an event occurs making the road impassable or unsafe for travel. Utility repairs may be delayed if roads are not maintained appropriately. Data collection sites may be inaccessible and a year’s data not collected if roads are not adequately maintained to provide access.

## **RECOMMENDATIONS**

- Use the key road system as basis for making site-specific road management decisions. If needed, adjust the system to meet changing needs and conditions over time.
- Identify and map in the Forest Geographic Information System (GIS) key cooperative data sites, utilities, the North Umpqua Hydropower Project, and special use sites. Maintain road access to these areas.
- Reference FSM 7732.22, 7732.23, 7732.24, and 7732.25 for road maintenance policy direction applicable to access for cooperators and special use sites.
- Identify and map in the Forest Geographic Information System (GIS) key water sources, cooperative data sites, utilities, and special use sites and maintain road access to these areas.

- Implement the transportation requirement of the SA and TMP for the North Umpqua Hydroelectric Project.

❖ **ISSUE: Private land in-holders and forest users depend on Forest roads for access.**

**CURRENT SITUATION**

The National Forest Roads and Trails Act of October 13, 1964 as amended<sup>15</sup> authorizes the road (and trail) systems for the National Forest and the granting of easements across Forest Service administered lands<sup>16</sup>.

Road easements, road share cost agreement areas exist on the Umpqua National Forest to provide access to in-holdings for purposes of mining, logging ranching, and private residences. Road user permits are issued to private landowners for short-term (five years or less) for hauling commercial products from private lands across National Forest system roads. Additional future requests for easements and road use permits for access to private lands are anticipated.

Reasonable access to patented mining claims may be granted to mine operators under the provisions established under the Alaska National Interest Lands Conservation Act (ANILCA). This statute ensures access to private land in-holdings.

**RISKS AND BENEFITS**

Inadequate maintenance may make access to private land difficult to impossible.

**RECOMMENDATIONS**

- Use the key road system as basis for making site-specific road management decisions. At the District or appropriate scale, consider whether the key Forest roads meet current public access needs. If such needs are not addressed by the current key road system, adjust or modify the key road system.
- Identify and map in the Forest Geographic Information System (GIS) private land and maintain access to these areas.
- Identify and resolve right-of-way and easement issues.

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<sup>15</sup> 16 U.S.C. 532-538, Public Law 88-657

<sup>16</sup> USDA Forest Service. 2001a. Forest Service Manual 7700: Transportation System, WO Amendment. 7701.3 -2001-1: Transportation System Management, 1/12/2001.

- ❖ **Issue:** Roads are essential to providing reasonable access to developed and dispersed recreation opportunities and settings located on the Umpqua National Forest.

## CURRENT SITUATION

Significant comments regarding the need to maintain Forest access for all forest users was received during the public involvement meetings for this Roads Analysis.

The 1994 Access and Travel Management Plan and the 1996/1998 updated ATM analysis recognized that people and local communities depend on some Forest roads more than others. The Primary and Secondary Roads are the key or priority roads that connect State and County highways, provide access to communities, provide access to developed recreation sites, and provide access for dispersed recreation opportunities, connect land in other ownership, and provide important access to tribal traditional use areas. These roads are the first to receive appropriated road maintenance funding.

The Umpqua National Forest offers numerous outdoor recreation settings and opportunities. Some of these include:

- Five Congressionally designated areas (North Umpqua Wild and Scenic River, Oregon Cascades Recreation Area and three Wilderness areas);
- Diamond Lake Recreation Composite;
- Lemolo Reservoir;
- Toketee Reservoir;
- Several smaller lakes and water impoundments;
- 530 miles of summer trails (See Appendix C: Road Management Information for road access to trailheads);
- 78 miles of Nordic ski trails;
- 147 miles of motorized winter trails;
- Several spectacular water falls;
- Brice Creek recreation corridor;
- South Umpqua recreation corridor;
- Little River recreation corridor;
- 496 concentrated use areas (dispersed recreation sites);
- Mt. Bailey snowcat skiing;
- Four recreation resorts (Diamond Lake Resort, Diamond Lake R.V. Park, Lemolo Lake Resort, and Steamboat Inn); and
- Six Forest Service owned recreational rental cabins/ lookouts (Musick Guard Station, Butler Butte Cabin, Pickett Butte Lookout, Acker Rock Lookout, Fairview Lookout, and Whisky Camp).

Recreational activities within Forest include angling, camping, sightseeing, trail use, boating, whitewater rafting and other water activities, hunting, snow based activities, etc.

The Forest has 46 developed recreation sites located on the Forest, including 38 campgrounds. Approximately 70% of the Forest develop recreation site capacity is located on the Diamond Lake Ranger District. About 45% of the developed recreation sites are located at the Diamond Lake Recreation Composite. The developed recreation capacity on the Forest is shown below.

**TABLE 5. UMPQUA NATIONAL FOREST DEVELOPED RECREATION CAPACITY**

<b>District</b>	<b>Total PAOT*</b>	<b>Campgrounds/ Total Sites</b>	<b>PAOT - Days</b>	<b>Percent PAOT-Days by District</b>
Cottage Grove	448	5 / 29	130 M	6
Tiller	537	10 / 47	203 M	10
Diamond Lake	6,467	12 / 528	1,136 M	57
North Umpqua	2,183	15 / 150	548 M	27
Forest Total	9,635	42 / 754	2,017 M	

\*PAOT – Persons At One Time, capacity

Diamond Lake and Lemolo Lake are within Administratively Withdrawn Areas under the Forest Plan, as amended by the Northwest Forest Plan. The focus of the management direction for these areas is developed roaded recreation. The North Umpqua Wild and Scenic River and Oregon Cascades Recreation Area have specific management plans, including standards and guidelines related to recreation and access.

The Forest participated in the National Visitor Use Monitoring (NVUM) project from October 2000 through September 2001. Additionally, during this same time period managers on the Umpqua National Forest realized a need to develop Information about recreationists’ preferences and perceptions about recreational opportunities on the Umpqua National Forest. Researchers from the University of Florida and Penn State conducted visitor surveys focusing on the needs, expectations, and satisfaction levels of recreational users in the Umpqua National Forest. The purpose of this investigation was to examine recreational use patterns, satisfaction levels, economic expenditures, and experiences currently occurring on the Umpqua National Forest. This information provides baseline data and suggests management actions to address current issues identified in the study. More detailed information was studied for two sub-studies (Recreation Participation at Diamond Recreation and South Umpqua River Corridor). Key findings of these studies were:

- The respondents in this study appear to be long-standing, loyal visitors of the Umpqua NF. Nearly 80% of all respondents were repeat visitors, and over half of the visitors first visited the Forest prior to 1981.

- Nearly three-quarters of the respondents recreated solely on the Umpqua NF during the trip on which they were interviewed, and just over half of the respondents said that the Umpqua NF was their primary destination.
- For respondents who visited multiple locations during the trip on which they were interviewed, Crater Lake was the most popular response.
- Nearly three-quarters of the visitors had spent the previous night on the Forest, and of those respondents, 40% spent only one night.
- The mean number of persons per vehicle was 2.67, and just over one-quarter of the respondents had at least one child with them.
- About 40% of the overnight visitors planned to be away from home for a period of 6-10 days, indicating that the Umpqua NF was their choice of a location for their vacation.
- Diamond Lake District visitors were more likely to be first-time visitors (27%), while all of the Cottage Grove respondents were repeat visitors, and virtually all (91%) of Tiller visitors were repeat visitors.
- Visitors to the Cottage Grove were most likely to have visited over 20 times in a typical year (33%), while North Umpqua District visitors were least likely (8%) to have visited so frequently.
- About one-fifth of the Diamond Lake (21%) and North Umpqua (20%) respondents visited no other parks/forests in a typical year, compared to just 6% of Cottage Grove respondents.
- Tiller and Cottage Grove respondents were much more likely to have visited only the Umpqua NF on this particular trip (94% and 100%) than Diamond Lake visitors (62%).
- The Umpqua NF was the primary destination of three-quarters of North Umpqua respondents (75%), compared to just over half (52%) of Diamond Lake visitors.

Visitor use estimates are available at the national, regional, and forest level. Only forest level data is provided here.

**TABLE 6. UMPQUA NATIONAL FOREST ANNUAL RECREATION USE ESTIMATE, FY 2001**

<b>National Forest Visits</b>		<b>Site Visits</b>		<b>Wilderness Visits</b>	
Visits	Error Rate	Visits	Error Rate	Visits	Error Rate
734,805	21.6 %	1,167,525	21.3 %	20,587	39.0 %

The average recreation visitor went to 1.6 sites during their Forest visit. Forest visitors sometimes go to just one national forest site or area during their visit. For example, downhill skiers may just go the ski area and nowhere else. Almost 55 (54.9) percent of visitors went only to the site at which they were interviewed. The FY 2001 recreation use surveys found the popular recreation activities on the Forest were: hiking/walking, relaxing, viewing natural features, viewing wildlife, and driving for pleasure (Table 7).

Each visitor also picked one of these activities as their primary activity for their current recreation visit to the forest. The top primary activities were developed camping, hiking/walking, hunting, driving for pleasure, relaxing, and fishing (Table 7).

**TABLE 7. UMPQUA NF ACTIVITY PARTICIPATION AND PRIMARY ACTIVITY, FY 2001**

Activity	Percent participation*	Percent of Participant's primary activity
Camping in developed sites (family or group)	24.5	16.1
Primitive camping	4.8	1.1
Backpacking, camping in unroaded areas	2.3	0.1
Staying at Resorts, and cabins	16.1	4.9
Day gatherings in developed sites (family or group)	13.9	1.7
Viewing wildlife and natural features – site seeing,	38.1	7.0
Visiting historic and prehistoric sites/area	1.8	0.1
Other- relaxing, hanging out, escaping heat, etc,	38.4	9.4
Fishing- all types	16.8	9.3
Hunting- all types	16.0	11.6
Off-highway vehicle travel (ATV, etc)	2.4	0.9
Driving for pleasure on roads	27.5	10.4
Winter sports: Snowmobile travel, skiing, etc.	4.4	3.4
Motorized water travel (boats, water skiing, etc)	4.1	0.5
Hiking or walking	38.5	12.3
Horseback riding	1.8	0.2
Bicycling, including mountain bikes	10.6	6.1
Non-motorized water travel (canoe, rafting, etc.)	1.4	0.4
Other non-motorized activities	14.0	4.5
Total	100+	100

\* Exceeds 100%, as visitors will participate in multiple activities on same visit to the Forest.

## **RISKS AND BENEFITS**

One of the Forest Service priority Strategic Objectives for FY 2005 is to “improve the capacity of the Nation’s forests and grasslands to provide diverse, high quality outdoor recreation opportunities.” Providing reasonable and safe access is an important element in delivering quality recreation programs and services on National Forests.

The community and businesses in the County derive an important economic benefit from the recreation visitors to the Forest. The FY 2001 study asked visitors about their monetary expenditures in and near the Umpqua NF (within 50 miles). Over half of the Umpqua NF visitors indicated that they would have gone somewhere else to do the same activity if they had not been able to visit the Umpqua NF. With over half of the visitors using an overnight facility, most expenditures fell in the food/drink at restaurant and bars and lodging categories. During the study, visitors were asked how much they spent for ten categories of expenditures on that visit/ trip to the Forest (within 50 miles of the recreation site visited on the Forest). Privately owned lodging was the highest expense for the respondents. The average amount spent by visitors who had spent any money on lodging was \$194. The average amount for those who spent some money in restaurants and bars was \$58, and \$38 for “other food and beverages.”

Visitors who reported purchases of “souvenirs/clothing,” spent an average of \$33.

For respondents who reported spending some money on outdoor recreation activities during a typical year, the average amount spent was \$2055. Diamond Lake District visitors reported spending more money in total on an average year

(\$2268) than respondents across the other three districts (\$1652).

Overuse of recreation areas, and sensitive landscapes by recreationists can lead to degradation of natural resources, disruptions of wildlife, etc. See aquatic and terrestrial issues regarding adverse effects of access.

## **RECOMMENDATIONS**

- At the watershed or project scale, consider whether the key (Primary and Secondary Roads) Forest Roads meet current public access needs. If such needs are not addressed by the current key road system, recommend adjustments or modification to the key road system.
- Maintain linkages to State Highways 138 and 227, County Roads 1, and Brice Creek and Sharps Creek roads.
- Since access routes to most developed recreation sites on the Forest have an “encourage” road management strategy, a high priority should be placed on the maintenance of these routes. This includes sign maintenance.

❖ **ISSUE: Roads maintain access to socially, historically, and culturally important sites.**

**CURRENT SITUATION**

People feel connected to certain places for a variety of reasons.

Areas of unique ecosystems and habitats, outdoor recreation, scenic quality, and a sense of place are attributes and activities valued primarily for their social, psychological, and cultural significance.

Sites of cultural and historic value are protected under the Preservation of American Antiquities Act of 1906 and the Archaeological Resources Protection Act of 1979.

Roads help access important tribal use areas.

Executive Order 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations requires that identifying and addressing disproportionately high and adverse human health and environmental effects on minority and low-income populations from Federal programs, policies, and activities be part of the mission if all Federal agencies.

**RISKS AND BENEFITS**

Road effects on cultural sites may range from increased site protection and enhanced interpretation to degradation due to increased access by looters and vandals.

Any disproportionately high and adverse human health and environmental effects associated with a specific road or project would be addressed when the project is estimated and evaluated with public involvement.

Roads also increase the potential for garbage dumping in the forest and pollutants entering streams.

**RECOMMENDATIONS**

- Use the key road system as basis for making site-specific road management decisions. At the District or appropriate scale, consider whether the key Forest roads meet current public access needs. If such needs are not addressed by the current key road system, recommend adjustments or modification to the key road system.
- Maintain linkages to State Highways 138, 230, and 227 (east end of Tiller-Trail Highway).
- Maintain linkages to County Road 1 (Tiller-Trail Highway), County Road 2470 (Brice Creek Road 2200), Row River Road (Rd 2400), Little River Road (Rd 6900), County Road 17A, Tiller-South Umpqua Highway (Rd 2800), Sharps Creek Road (Rd 2460), and Upper Cow Creek Road (Rd 3600).
- If budget shortfalls limit maintenance of the key Forest road system to standard, consider site-specific maintenance as problems arise. For example, risks to public safety can be mitigated by brushing in hazardous areas, spot rocking, or by signing critical junctions until full maintenance can be accomplished.

- ❖ **Issue:** Identification of potential Public Forest Service Roads is an important element in developing alternative funding opportunities for the higher standard and important public access roads through the Forest.
- ❖ **Issue:** Designated Scenic Routes showcase unique scenic, cultural, historic and recreational settings and opportunities, and therefore require focused and special transportation management.

## CURRENT SITUATION

Presently, there are three designated scenic routes located on the Umpqua National Forest. These are:

- The State and FHWA have designated Rogue Umpqua Divide National Scenic Byway (State Route 138) offers spectacular sightseeing and has a number of roadside pullouts, picnic areas, and waysides that are used by recreationists.
- The Umpqua and Willamette National Forests have designated a route on National Forest System roads between Oakridge Oregon and Highway 138 (State Route 138) near Lemolo Lake as Diamond Drive. This route is currently proposed for future reconstruction that would make it eligible as an extension of the West Cascades Scenic Byway.
- A route partially located on National Forest System roads (Forest Road 2810) on the Tiller Ranger District, designated by the State as the Historical Myrtle Creek – Canyonville Tour Route. This is a 68-mile tour route celebrating Douglas County history and the resources that helped to build it. Sights include a covered bridge built in 1920, several historic homes, and breathtaking forest views.

The higher standard arterial and collector roads on the Forest road system serve as important public access roads through the Forest. These roads provide access to the National Forest resources benefiting communities in or near the Forest as well as forest visitors from across America and beyond. This sub set of National Forest System roads needs to be identified as public roads, open to public travel, and constructed to provide safe, adequate and environmentally sound access to federal lands. The Forest Service is seeking Congressional authorization to use Federal Highway funding for the reconstruction of major public access routes under the next reauthorization of TEA-21. Action on the reauthorization of the Highway Trust fund will occur in 2003. Each National Forest has been requested to identify potential Public Forest Service Roads (PFSR) and high priority PFSR projects in preparation of the potential action by Congress.

The authority to designate Public Forest Service Roads (PFSR) was delegated to the Regional Foresters (RF) by the Acting Deputy Chief for National Forest System, Gloria Manning, in her October 16, 1998, letter that declared the Forest Service as a public road authority. "PFSR" is a designated public road under Forest Service jurisdiction that meets the definition of 23 U.S.C. Section 101. "Public Road" means any road or street

under the jurisdiction of and maintained by a public authority and open to public travel. “Designation” means identification, and inclusion in a network, of those FS roads meeting the criteria of a PFSR and recorded officially in the Forest Service Infra database. A map of the potential PFSR’s on the Umpqua is attached to this report. It displays the potential Public Forest Service Roads that have been identified by the Forest. These routes are also identified in the INFRA road inventory for the Umpqua National Forest.

The Forest has identified two high priority project proposals for PFSR program funding. These projects are:

- West Cascades Scenic Byway Extension - The Umpqua, Willamette, and Deschutes National Forests propose to reconstruct portions of the route known as Diamond Drive to a double-lane, paved standard. The reconstruction would provide a route that would be eligible to be included in the West Cascade Scenic Byway. The project includes segments of roads 2154, 6000-770, 6000-700, 2614, 2612, and 2610. Twenty-two miles of single-lane road will be widened and paved, and six miles of double-lane road will have an asphalt overlay applied.
- Diamond Lake Loop Road - The road system consists of 12.3 miles of double-lane paved road that loops around Diamond Lake, along with short connector roads to State Highways 138 and 230, which are part of the Rogue-Umpqua National Forest and State Scenic Byways. Approximately 4.0 miles of the road needs to be completely reconstructed, while another 0.5 mile of the road needs a structural pavement overlay. Signing, pavement striping, and traffic control measures will be upgraded to meet the standards for a public forest access road. Drainage structures that have reached or surpassed their life expectancy and are in need of replacement will also be replaced and upgraded.

## **RISKS AND BENEFITS**

Driving for pleasure is increasing as a recreational activity nationally<sup>17</sup>. As the population ages, this recreational experience will continue to expand. State and Federal officials have recognized the increased demand for roaded recreational activities, and have designated National, State and Forest Service Scenic Byways as one means of providing safe and rewarding driving opportunities.

The Proposed PFSR program projects will enhanced recreation visitor experiences, reduces deferred and annual maintenance needs and extended life of existing pavements, and improved traffic safety through signing and striping in accordance with MUTCD.

Designated scenic routes lead to more trips and hence more traffic-generated economic activity. It is part of the overall rural economic strategy. The National Scenic Byways Research Committee and America’s Byway Resources has identified potential economic impacts of designated scenic routes based on a review of 21 economic research studies (Economic Development Research Group, 2001). These studies

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<sup>17</sup> Roper-Starch. 2000. Outdoor Recreation in America 2000: Addressing Key Societal Concerns. Prepared for The Recreation Roundtable: Washington, DC.

indicated that scenic route visitors spend between \$50 and \$190 per day, that total business spending increase along or near the scenic routes, and 19 – 33 jobs are created for every one million dollars in visitor spending.

## RECOMMENDATIONS

- Continue work with other partners in the implementation of the Rogue Umpqua National Scenic Byway Corridor Management Plan, and Byway Enhancement Projects.
- Develop corridor management plans for the Historical Myrtle Creek – Canyonville Tour Route and Diamond Drive.
- Continue with planning and preliminary design work for the West Cascades Scenic Byway Extension PFSR project.
- Identify other potential PFSR projects.
- Scenic Routes located on National Forest System roads, and potential PFSR should be given the highest Forest priority for road maintenance as they have the highest traffic volumes on the Forest and drivers that are the least familiar with driving on forest roads.

### ❖ **ISSUE: Roads influence wildfire occurrence and the ability to suppress wildfires.**

## CURRENT SITUATION

Road systems within the National Forest System serve a very important purpose in the suppression of wildfires. Road systems can affect the response time to initial attack fires and can make the difference whether or not these fires become extended attack project type fires.

Some additional wildfire risk from an increase in fuel loading above historic levels has developed on the Forest. Without adequate levels of funding to properly treat hazardous fuels on the ground this situation may increase over time. This risk is highest where Forest management is adjacent to private lands and adjacent to infrastructure development, such as the community of Tiller, resorts, Toketee Ranger Station and Clearwater village (PaciCorp).

The current fire protection infrastructure, such as roads and water delivery systems, is often inadequate for property and resource protection in wildland /urban interface areas and in the forest in general during fast-moving wildfires.

On the Umpqua, the fire suppression effort is between the Oregon Department of Forestry (ODF), the Douglas Forest Protective Association (DFPA), and the US Forest Service (USFS) working under a cooperative agreement.

In general, roads have to be evaluated on a case-by-case basis while maintaining the big picture, sub-basin approach. On the Umpqua, if public access is limited, the risk of

human caused wildfires (23% of total fires<sup>18</sup>) will be minimized. However, in the event that we do incur fires with poor accessibility, the risk of a catastrophic event occurring is greatly increased.

The Fire Management Officers of the Umpqua and representatives of the Douglas Forest Protective Association have identified which key roads and additional potential secondary roads that are needed to assist in fire protection and primary initial attack for wildfire on the Forest, particularly where the wildland urban interface exists. This includes consideration of private land in-holdings on the Forest. If funding becomes available to maintain these additional roads, then will be maintained as secondary roads. See Appendix C: Road Management Information for a list of roads of importance for fire suppression.

## **RISKS AND BENEFITS**

The cost of improving the existing road and water delivery systems infrastructure to protect all resources and property from fire would be prohibitive. What can be addressed is the management of vegetation throughout the forest, and in particular both sides of the property line in the wildland/urban interface, to provide a defensible space for firefighters. Roads without adequate vegetation management place both human safety and property at risk. Roads of lowest value to firefighters are short dead-end spurs and may pose a threat to human safety due to entrapment.

Roads that are gated or block public access, but still maintain access for administrative use in order to fight wildfires or for medical emergency access are the best-case scenarios. However, funds for the best-case scenario transportation systems are not available and wildlife and aquatic systems do not benefit from maintaining a high road intensity level.

Any fires that do occur in unroaded areas, or areas where we have decommissioned the road system, have the potential to become high intensity fires and delay stands from reaching the desired late seral stages of development. This impacts flora, fauna and water quality over time.

In areas of poor accessibility higher property damage could result. Dead-end roads are a high risk to firefighter safety as the escape routes are very limited. These areas also need to have agreement with our cooperators concerning any road decommissioning that could affect their ability to provide adequate fire protection.

## **RECOMMENDATIONS**

- Use the key road system as basis for making site-specific road management decisions. If needed, recommend adjustments or modification to the key road system.
- Roads determined to be key Forest routes should be maintained at a high level for quick response of emergency vehicles of all sizes and visibility for safe travel.

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<sup>18</sup> USDA Forest Service. 2002b. Umpqua National Forest Annual Fire Report. Umpqua National Forest: Roseburg, Oregon.

- Consult with fire suppression cooperators and the Forest Fire organization when determining which roads to close or decommission.
- See other funding opportunities, such as Payco, for road maintenance of important initial attack routes that are not currently included in the key road system on the Forest. If such funding becomes available, these additional roads would be maintained as secondary roads.
- For Firefighter Safety: Roads accessible by fire equipment should be accurately mapped and signed. Identify dead-end roads and map potential hazards to firefighters and provide this information to firefighters to support effective suppression/pre-suppression strategies and avoid potential entrapment.  
This information should also reside in GIS for use at the appropriate scale based on fire size and location.
- Identify and map in the Forest Geographic Information System (GIS) key water sources, dead-end roads, and roads needed for adequate protection in the wildland/urban interface areas and maintain road access to these areas.

**❖ ISSUE: Roads provide access to locatable, leasable, and salable minerals.**

### **CURRENT SITUATION**

Federally owned minerals are grouped into three classifications: locatable, salable and leasable. Each mineral category is subject to a different method or mode of disposal under the general mining laws, as amended. Patented mining claims situated within the Forest boundary are private land in-holdings.

Reasonable access to patented mining claims may be granted to mine operators under the provisions established under the Alaska National Interest Lands Conservation Act (ANILCA).

Much of the mining activity on the Forest takes place within the Bohemia mining district. The Bohemia Mine Owners Association (BMOA) is an organized group of miners that has interest in mineral related matters within the Bohemia mining district and surrounding vicinity.

There do exist road easements to mineral patent in-holdings for purposes of mining or logging. Additional requests for easements to log private land in-holdings and conduct mining operations can be anticipated in the future.

Developed material sources occur throughout the Umpqua. Most of these larger rock quarries and smaller roadside borrow pits have not been entered in many years due to the dramatic decline in programmable timber harvest on the Umpqua and the need to use these rock materials for road construction and in their maintenance.

## **RISKS AND BENEFITS**

As maintenance budgets continue to decrease, there is a risk that road safety deficiencies will increase over time. Roadside hazards may not be immediately identified and responded to in a timely manner.

## **RECOMMENDATIONS**

- Use the key road system as basis for making site-specific road management decisions. At the District or appropriate scale, consider whether the key Forest roads meet current public access needs. If such needs are not addressed by the current key road system, recommend adjustments or modification to the key road system.
- Identify road systems that provide access to mineral patent in-holdings (private land ownership) and key designated Forest administered material sources.
- Utilize the Forest Rock Resource Layer in the Forest Geographic Information System (GIS) (layer presently under construction) to identify Forest designated material sources.
- Query the Bureau of Land Management's nationally centralized LR2000 Reporting Database to identify the general location (legal description) of registered active and close file unpatented mining claims. The Bureau of Land Management State Office (Mining Claim Recordation Section) can provide more detailed descriptions and site maps for specific mining claims based on the lead file number listed in LR2000. The location of patented mining claims can be referenced from Master Title (MT) Use Plats. Access must be maintained to these claim sites.
- Reference FSM 7732.03 and 7732.22 for road maintenance policy direction applicable to locatable, leasable, and salable minerals. Provide access where required.

**❖ ISSUE: Roads provide access to forest resources for management, including commercial use, restoration and protection.**

## **CURRENT SITUATION**

Road systems allow access to forest resources and enable management, including both protection and commercial use. The current road system provides access to most of the stands requiring vegetation management on the Forest. However, as more roads are closed or decommissioned, vegetation management activities may be limited or precluded due to higher unit costs.

The Northwest Forest Plan and emerging forest ecology research indicate that active management of plantations is important to restoring late successional forest characteristics across the landscape. Silvicultural activities promote diverse stand structure by manipulating stand density, maintaining stand diversity where some portions of the landscape have a desired condition to establish shade-tolerant species

in the understory while others will be managed in an early seral condition to maintain hardwoods and pine species.

The Forest management strategy prioritizes watershed restoration activities, including vegetation management treatments, to concentrate management activities over a short timeframe followed by a period of minimal management. Roads can be closed for a period of time (one year or longer) and then re-opened intermittently for silvicultural treatment.

## **RISKS AND BENEFITS**

Permanent and temporary road construction and reconstruction causes a direct loss of site productivity on the acres occupied by the road. This is most important with roads near or encroaching on wetland or riparian areas and unique habitats, although Forest Service policy is to avoid or minimize the effects to these areas. Although not irreversible, land occupied by roads is essentially lost to long-term productive vegetative use.

Roads can also increase the risk of wood theft from riparian areas or upland locations already low in down wood needed to ensure both habitat for wildlife and long-term soil productivity.

## **RECOMMENDATIONS**

- Use the key road system as basis for making site-specific road management decisions. If needed, recommend adjustments or modification to the key road system.
- Close or restrict road access where used only intermittently for forest vegetation management activities.
- Maintain access to current or planned (in the near future) vegetation management projects.
- Identify, maintain, and GIS map key access points to accommodate equipment needed for vegetation management treatments.

❖ **Issue: Public safety risks on the Forest road system are potentially increasing as the Forest road system deteriorates over time and deferred maintenance needs of roads and bridges increases.**

## **CURRENT SITUATION**

The Forest Service FY 2005 Performance Management Plan (1/15/03) has identified the following management objectives:

- Under Strategic Objective 2d – Provide a safe and economical infrastructure and transportation systems.
- Strategic Objective 4b – Improve the safety and economy of USDA Forest Service roads, trails, facilities, and provide greater security for the public and employees.

Road condition surveys conducted on the Forest in the past three year, based upon WO protocols have found that there is \$1,088,405 in critical health and safety deferred maintenance needs on the Forest. The total health and safety deferred maintenance needs on the Forest is \$7,015,767.

The Forest has 102 road bridges on the Forest. The National Bridge Inspection Standards (NBIS) require bridges to have technical bridge inspections conducted by qualified personnel every two year. The Forest has a backlog of these inspections and is not keeping up with this requirement.

There is very limited funding available for work that will reduce the critical safety deficiencies/ deferred maintenance backlog that exists on the Forest.

### **RISKS AND BENEFITS**

As maintenance budgets continue to decrease, there is a risk that road safety deficiencies will increase over time. Roadside hazards may not be immediately identified and responded to in a timely manner.

The potential for increase tort claims increase with unresolved critical safety deferred maintenance.

### **RECOMMENDATIONS**

- Implement a Safety Management System on passenger car roads, as per FSM 7733.2
- Increase bridge safety inspections so that by the end of 2004 all bridge inspections have been complete according to the requirements of the NBIS (FSM 7736).
- As budget shortfalls limit maintenance of the Primary and Secondary Roads from being accomplished to standard, use site-specific maintenance as problems arise to resolve or mitigate critical safety hazards. Use road conditions surveys and hazardous evaluations to identify the highest hazard sites on Primary Roads. Mitigate safety hazards by using techniques such as brushing in hazardous areas, spot rocking, or using warning signs, or in some situations, closing roads until critical maintenance can be accomplished to mitigate risks to public safety.
- Open Forest roads should be maintained to at least minimum safety standards, including clearing vegetation for minimum sight distance and treatment of hazard trees. Unsafe roads need to be analyzed and scheduled for maintenance to eliminate critical safety hazards, or considered for closure.

**❖ Roads permit access for activities known to be harmful to the resources: illegal fishing, poaching, vandalism, and litter.**

### **CURRENT SITUATION**

Vandalism, poaching, and illegal activities, including littering, dumping, and illicit fishing, are common occurrence across the national forest lands. Road makes access to remote sites easier for people to practice these activities. The LEIMARS database

contains information gathered from law enforcement personnel when patrolling and ticketing.

## **RISKS AND BENEFITS**

Since most of the main rivers and many of the larger fish-bearing tributaries outside of wilderness have riparian roads, access for legal and illegal angling has increased. Poaching is a concern for at-risk species due to lack of state and Forest Service law enforcement capabilities, and increased access to streams where fish migrate, spawn and/or rear young. Roads also increase the risk of wood theft from riparian areas and the potential for garbage dumping and pollutants entering streams.

The benefit of identifying and managing road access is that it prioritizes funding to those roads most important to the forest users and puts a premium on maintaining roads that may harm resources if not regularly maintained. The map of key Forest roads (Appendix D) displays the priority road network.

## **RECOMMENDATIONS**

- Consider the effect of roads on illegal fishing, poaching and theft. Weigh resource costs against road access benefits. Utilize the LEIMARS data base tool to help with this analysis.

## **AQUATIC ISSUES**

❖ **ISSUE: Roads can affect water quality and the beneficial uses of water.**

### **CURRENT SITUATION**

Road construction, maintenance, reconstruction or decommissioning can change water quality by removing trees that shade and stabilize streambanks. Roads can cause surface erosion and landslides to deliver more sediment to streams than they historically carried, and can increase flood flows that scour channels.

Most named streams on the Umpqua (except spring-dominated rivers in the High Cascades) are warmer than the Oregon water quality standard for temperature. Other streams and some lakes do not meet standards for pH, dissolved oxygen; total dissolved gas, sediment, flow modification, habitat modification, aquatic weeds and algae, and biological criteria.

The Oregon Department of Environmental Quality designates specific streams on its list of Water Quality Limited Waterbodies<sup>19</sup> where standards are not met and beneficial uses are not protected. A complete list of water quality limited stream reaches is available on the Oregon Department of Environmental Quality web site:

<http://www.deq.state.or.us/wq/303dlist/303dpage.htm>

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<sup>19</sup> USDI, Environmental Protection Agency. Federal Clean Water Act, Section 303d.

The Oregon Department of Environmental Quality writes Total Maximum Daily Loads (TMDLs) and Water Quality Management Plans (WQMPs). National Forests implement those plans. A TMDL determines the sources of pollutants or contributions to water quality violations, and the water quality plans assign responsibility to those in the watershed to correct them.

Any activities that could affect stream temperature, sediment, pH, dissolved oxygen or aquatic habitat must include these measures, so it's important to include them in all project plans. Project plans to maintain, improve or decommission roads should recognize violations of water quality standards.

See the Issue "Roads can affect water quality and the beneficial uses of water" in Appendix F: Aquatic Information for a procedure to document water quality conditions and protection measures. Map F-2 shows stream reaches that don't meet water quality standards.

## **RISKS AND BENEFITS**

Road construction, maintenance and decommissioning can affect water quality and beneficial uses. Mitigation practices on existing roads, like interrupting ditches before they reach streams, can improve water quality. Similar measures can prevent water quality affects from new activities.

## **RECOMMENDATIONS**

- Whenever road reconstruction and new road construction activities are planned, document whether water quality standards are met downslope and downstream. Plan measures to protect and improve water quality using best management practices, document those measures, and make a finding that water quality standards will be met per the Umpqua Forest Standards and Guidelines<sup>20</sup>. Follow existing water quality management plans.
- Investigate water rights necessary to use water for all road activities. Hydrologists and the Oregon Department of Water Resources Watermaster can help determine if water is available for a proposed use.

**❖ ISSUE: Roads can intercept and re-route streamflow, increase peak flows, and change the timing of storm runoff.**

## **CURRENT SITUATION**

Roads can intercept surface and subsurface runoff. During floods, ditches act as an extension of the stream network, and may increase peak flows.

Watershed analyses on the Umpqua show that watersheds with gentle, earthflow terrain have been affected the most by roads. These landscapes have fewer streams and more roads than steep land, so road ditches can add more miles to the stream network. In Jackson Creek, a tributary of the South Umpqua River, the watersheds of Ralph, Tallow,

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<sup>20</sup> USDA Forest Service. 1990b. Umpqua National Forest Land and Resource Management Plan. Umpqua National Forest: Roseburg, Oregon: Chapter IV, Standards & Guidelines #21, 63.

Deep Cut, Whiskey and Soup Creeks all had road ditches connected to these creeks that totaled more than 40 percent of the natural stream miles. Across the Forest, earthflow landscapes are common in Cavitt, Little River, the Middle North Umpqua, Middle and Upper South Umpqua, and Layng Creek watersheds.

### **RISKS AND BENEFITS**

Increased peak flows can change streams. Stream channels are primarily formed by the “bankfull” flow, the flow that deposits gravel bars and forms floodplains. Increasing the flow may make channels wider and shallower, or scour channels to bedrock.

Higher peak flows can simplify streams, and affect water quality. Wider streams are generally warmer since they get less shade from riparian trees. Bedrock channels favor algae growth and less aeration, with high pH during the day and low oxygen at night. Erosion and pollution can reach streams through road ditches.

### **RECOMMENDATIONS**

- During project and watershed scale road analysis evaluate unneeded roads for decommissioning or closure (Level 1 maintenance).
- Waterbar roads, within budget constraints, to allow water from the ditch line to travel across the road surface to the slope below.
- Disconnect roads from stream channels by adding waterbars, culverts, rolling dips or cross-drains, as funding restoration and/ or road reconstruction project opportunities is available.
- Protect stream habitat by disconnecting roads from streams, as funding is available.

### **❖ ISSUE: Roads can alter the geomorphology of streams and floodplains.**

#### **CURRENT SITUATION**

Roadbeds located in valley bottoms can reduce the width of the floodplain and constrict the area across which the stream can meander.

On the Umpqua, some roads along streams access private land in the valley bottoms. Therefore, removing or re-routing these roads may take cooperation between the Forest Service, the Bureau of Land Management, local government, and private landowners. Other roads along streams provide the primary access to large tracts of National Forest System lands. Relocation of these roads may not be economically viable.

Jackson Creek Watershed Analysis showed how parts of the Jackson Creek Road occupied important floodplain habitat. Most roads adjacent to the named streams in the South Umpqua, North Umpqua and Row River watersheds constrict some stream reaches or their tributaries. Even streams that only flow across the floodplain during the winter were once steelhead habitat before road fills or culverts kept fish from using them.

## **RISKS AND BENEFITS**

Roads that impinge on low-gradient stream channels (<2% slope) cause channel erosion and deposition, and the degradation of the habitat associated with migrating channels. Also, the roadbed is at risk of erosion, which usually requires bank stabilization measures, such as riprap. Riprap is often used to prevent streams from undercutting the road. Streams with riprap provide fewer habitats for fish and riparian species than streams with natural floodplains.

## **RECOMMENDATIONS**

- Where appropriate, during project or watershed scale road analysis evaluate local National Forest roads within flood plains for relocation or decommissioning. Work with the county governments and willing landowners to develop other access routes outside of flood plains.
- Analyze situations where Forest roads are built across stream channels. Determine whether fills should be removed from stream crossings when decommissioning roads; balance cost with benefits of doing this action.

## **❖ ISSUE: Road stream crossings restrict passage of fish and other aquatic life.**

### **CURRENT SITUATION**

Using a consistent Regional protocol, inventories completed on the Umpqua in 2001 found that 145, or 88 percent, of inventoried culverts on fish-bearing streams are barriers to at least one life stage of at least one of fish species. The fish evaluated were Oregon Coast Steelhead, Oregon Coast Coho, Oregon Coast Spring Chinook, Oregon Coast Cutthroat; Upper Willamette Cutthroat; and rainbow trout. There are about 330 miles of accessible steelhead and salmon fish streams, and about 490 miles of resident cutthroat and rainbow trout streams on the Umpqua. Culverts block about 30 miles of adult and juvenile steelhead and salmon streams. Culverts block access to about 50 miles of resident cutthroat and rainbow trout streams.

### **RISKS AND BENEFITS**

Most culvert blockages prevent or restrict fish movement. Blockages at the crossing may be partial or total, and they can affect adult spawners, migrating juvenile fish, or both.

See “Road stream crossings restrict passage of fish and other aquatic life” in Appendix F: Aquatic Information for a more detailed discussion of this issue.

### **RECOMMENDATIONS**

- Provide fish and amphibian passage at the top five (5) culverts recommended in the 2001 Umpqua culvert inventory (Williams Creek, Cedar Creek MP 2.6 and 3.1, Emerson Creek, and Pinnacle Creek). Consult the *Umpqua Fish Passage at Road Crossings Report FY 00-01.doc* filed at:  
*J:\fsfiles\office\nat\_res\water\7700roads\culvert\_inventory\*

- Incorporate the findings of the Umpqua Fish Passage at Road Crossings Report FY 00-01 into the recommended projects in the Umpqua National Forest Restoration Business Plan – 2003 Update.

**❖ ISSUE: Roads can increase the potential for mass wasting (landslides) and sedimentation to streams.**

### **CURRENT SITUATION**

The dominant mechanism of sediment production within the thickly vegetated temperate rain forests of western Oregon is mass wasting erosion. Mass wasting (landsliding) processes comprise rapid-moving, shallow-seated debris avalanches and channelized debris flows that prevail in steep, well dissected terrain; and slower-moving, deeper-seated rotational slumps, earth flows, and related soil creep that abounds within gently sloping weakly-dissected landscapes. Areas of the Forest that are occupied by slump and earth flow complexes are referred to as “earthflow terrain”.

Debris avalanches and debris flows occur naturally, but the presence of roads can increase the potential for their occurrence during large intense storm events. Risk factors for road-related landslides include; mid-slope roads, roads built using side-cast construction techniques where unstable fills can become saturated and fail, and culverts (mainly at road stream crossings) that are either undersized for large storm events or become plugged by sediment and organic debris. Site failures at road stream crossings may result in overtopping (washout) or stream channel diversion down the ditch. Stream channels that divert flow down the ditch may trigger large landslides and large volumes of sediment flux into stream channels.

Prior to the mid 1970s, Forest roads were commonly constructed using side-cast construction techniques. Approximately 48% of the Forest road system was constructed before 1970. Waste disposal sites and sliver fills along roads typically contained large amounts of woody debris. Culvert capacities at road stream crossings were designed for 25- to 50-year storm events. Many of these older roads typically routed groundwater into sensitive areas of the hill slope that are naturally prone to landslide occurrence. As a result, the older roads dating prior to the mid 1970s tend to have the higher potential for increased risk of landslides.

With the advent of the Northwest Forest Plan in 1994 the Forest began to conduct limited field inventories along roads to identify sites of potential landslide risk. These road inventories were expanded to determine culvert hydraulic capacity and to identify sites at risk for stream diversion. Road inventories continue to be conducted on the Forest at the project scale.

### **RISKS AND BENEFITS**

Research shows mid-slope roads constructed on steep dissected ground that receive little or no maintenance pose the highest risk of initiating landslides and delivering sediment to streams. The impact of increased sediment levels into the aquatic ecosystem is largely dependent on stream channel characteristics and proximity to fish habitat. Debris flows originating from failed road stream crossing intersections tend to place very little large wood

into streams. The large sediment flux caused from failed road fill at stream crossings generally results in short-term detrimental effects, including aggrading channel beds, in-filling of pools, and covering existing spawning gravel with fine sediment. Roads constructed within areas of active slump - earth flow mass movements tend to have higher maintenance costs.

## RECOMMENDATIONS

- **Identify road systems that are at highest risk for landslides as part of project and watershed scale planning. If they are part of the future Forest road network (infrastructure) stabilize them; if not, consider them for temporary closure (storage/Level 1 closure) or for decommissioning.**
- **Utilize current technologies and methods to identify potential unstable roads and areas of potential debris flows associated with roads. These methods may include:**
  - **The SHALSTABco (version) digital terrain model that delineates chronically unstable and high potential instability sites for the occurrence of shallow rapid landslides in a steep dissected terrain (Appendix F: Aquatic Information, Attachment F-1).**
  - **Utilize geomorphic landform maps contained in watershed analyses to delineate areas of earthflow terrain that are high cost road maintenance areas and put resources at risk.**
  - **Model in GIS the stream channel gradients and tributary junction angles to determine what reaches of a stream are susceptible to channelized debris flows. This model can delineate scour, transport, and depositional reaches within stream channels at risk to debris flow occurrence.**
- **During project planning utilize available road stream crossing (culvert) inventories to determine the potential locations for site failure (via washout or diversion) and sediment delivery to aquatic habitat. Site failure potential represents the integration of hydraulic risk (culvert hydraulic capacity integrated with plugging potential) with consequences (volume of sediment predicted to be delivered into aquatic habitat should site failure occur).**

**❖ ISSUE: Roads can increase the potential for increased levels of fine sediment into streams.**

## CURRENT SITUATION

The dense vegetation cover and high infiltration (permeability) rates of most soils in an unmanaged forested landscape results in very low levels of surface erosion. Surface erosion from roads can occur where steep, sparsely vegetated cut slopes are present, in ditch lines (especially those with moderate to steep gradients), and from road surfaces that lack gravel aggregate or asphalt.

Certain types of bedrock substrate and unconsolidated deposits on the Forest have an inherent susceptibility for surface erosion when the vegetative cover is removed and the barren soil is exposed to the elements. Areas underlain by decomposed granitic and schistose rock types associated with the Klamath Mountains province have been identified as being particularly problematic. Unconsolidated Mazama air-fall ash and pyroclastic ash-flow deposits associated with the High Cascades sub-province are also considered to comprise highly erosive soils on the Forest (see Appendix F: Aquatic Information, Map F-1). “Earthflow terrain” is also considered to have inherent susceptibility to surface erosion processes. Areas identified as “earthflow terrain” have been compiled from completed watershed analyses (see Appendix F: Aquatic Information, Map F-1). In September 1979 the Tiller Ranger District issued a guideline policy for conducting land management practices of road construction and timber harvest prescriptions in areas underlain by granitic soils. In October 1995, this document was revised and expanded to include ‘schistose’ soils as the Tiller R.D. Granite/Schist Policy (Appendix F: Aquatic Information, Attachment F-2).

Chronic levels of surface erosion that originate from barren road surfaces and sparsely vegetated cut and fill slopes, and ditches represent a significant potential supply of fine-textured sediment flux that may reach and enter stream channels. Sediment diverted off the road surface and out of ditches is usually deposited at the base of the fills slope where it is filtered out into the vegetation before reaching a stream channel. Cross drains, water bars, and drain dips (sags) are constructed at frequent intervals along roads to facilitate the transfer of water and fine sediment out of the ditch prior to reaching a stream channel. Where the spacing of these structures is inadequate some level of fine sediment flux traveling down ditches is delivered directly into stream channels.

## **RISKS AND BENEFITS**

Fine sediment generated by surface erosion along road systems can enter into streams. This sediment flux fills pools and causes spawning gravels to become embedded or covered thus reducing the quality of fish, amphibian, and macroinvertebrate habitat.

## **RECOMMENDATIONS**

- During road maintenance activities leave ditch lines vegetated as often as possible. Vegetation acts as a filter that reduces the amount of fine sediment that reaches a stream crossing, however, vegetation will also reduce the hydrologic effectiveness of the ditch, possibly requiring a larger ditch design. Revegetate soil areas disturbed during road maintenance activities in accordance with Forest Plan standards and guidelines.
- Provide an adequate covering of surface aggregate (rock) on road systems in areas of highly erosive soils (see Appendix F: Aquatic Information, Map F-1).
- Update Umpqua commercial road rules to restrict timber haul on sensitive and unsurfaced roads to the dry season. If timber haul must take place during the wet season (see Umpqua NF 1980 LRMP for definition of wet season), monitor rainfall, and reduce or curtail timber haul during periods of prolonged or intense rainfall.
- Install and maintain water bars or drain dips on local roads not intended for passenger cars, to the extent that funding is available.

- During project planning utilize the Watershed Erosion Prediction Project (WEPP) method of analysis to model sediment migration from hill slopes and roads to stream corridors (Appendix A: Roads Analysis Process, Step 4 and Key Questions, AQ(2)).
- During project planning consider available road stream crossing (culvert) inventories. Explore opportunities to learn about specific fish runs in areas with high road densities. Consider partnerships with other agencies and stakeholders for more efficient and cost-effective analysis.
- During project planning that is related to road use, conduct road stream crossing inventories using protocols in Appendix H: Inventories and Assessment Protocols.

## TERRESTRIAL ISSUES

The Forest road network can significantly alter wildlife habitats and negatively impact wildlife populations. The negative effects of roads on wildlife (including listed and sensitive species) can be classified into three general categories:

- ❖ **ISSUE: Edge effects and fragmentation;**
- ❖ **ISSUE: Barriers to species movement; and**
- ❖ **ISSUE: Disruption of activities such as breeding, feeding, resting or dispersal activities as a result of the use and maintenance of the road system.**

### CURRENT SITUATION

**Edge effects** are the result of the interaction between two adjacent habitats, when the two habitats are separated by an abrupt edge. The ecology of forest edges is characterized by changes in biotic (parasites, predators and herbivores) and abiotic (microclimate, disturbance regime) elements. If exposure to the edge modifies the features of the forest beyond their range of natural intrinsic variation, then that area will be effectively reduced for conservation purposes<sup>21</sup>.

Forest **fragmentation** can threaten native wildlife populations by eliminating blocks of continuous habitat or by degrading the quality of remaining habitat for those species sensitive to an increase in the amount of forest edge. Currently, roads and the history of intensive timber harvesting are the major causes of forest fragmentation on the Umpqua National Forest. During the 1980s and into the early 1990s the continued decline in mature forest habitat led to listing of Northern spotted owls, and then the coho salmon in the late 1990s, as threatened under the Endangered Species Act (ESA).

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<sup>21</sup> Murcia, C. 1995. Edge effects in fragmented forests: implications for conservation. *Trends in Ecology and Evolution* 10: 58-62.

A second impact of roads on wildlife is a **barrier to species movement**. The barrier effect is sensitive to both road width and traffic density<sup>22</sup>. As road width and traffic density increase, roads become more effective barriers to movement<sup>23</sup>. Roads create additional barriers to movement where the road shoulders and cutbanks create an over-steepened slope, and where undersized culverts bisect channels. When habitat becomes fragmented, there is increased risk of population changes, and a progressive loss of biodiversity<sup>24</sup>.

Finally, the extensive network of Forest Service roads also creates opportunities for **human activities** to impact terrestrial wildlife. In past decades, the Umpqua road network was used to support timber harvest activities. As timber harvests declined, the road network continues to provide access for recreationists and hunters, impacting animals directly (e.g., deer, elk, and bear) or indirectly (disturbance from roadside camping).

Generally speaking, human influences on the Forest are greatest near roads and decrease steadily with distance from roads. Noise associated with road maintenance and use can disturb the breeding, feeding and rearing behavior of sensitive species such as peregrine falcons. Some roads have been closed during the winter season to reduce the impact of vehicles on deer and elk feeding and calving areas when their carbohydrate reserves are at their lowest and the animals are the most vulnerable.

## RISKS AND BENEFITS

The effects of fragmentation will continue until plantations (either through treatment or natural process) begin to reflect the composition and structure of adjacent natural stands. As fewer miles of open road are maintained, the barriers associated with an active road system will be limited to the key road system, or local roads during periods of active management. The remaining roads have become less of a barrier as vegetation has started to grow in them, fallen trees have remained in place, and culverts are removed during periods of closure. Chronic levels of disturbance from use and maintenance of the entire road system have been reduced as the total miles maintained annually have been significantly reduced.

## RECOMMENDATIONS

- During project and watershed scale road analysis evaluate unneeded roads for closure or decommissioning.
- Minimize the effect of noise from road maintenance, reconstruction or decommissioning by managing the seasonal and hourly operating periods of these activities, as per Endangered Species Act requirements.

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<sup>22</sup> Forman, R. T. and A. M. Hersperger. 1996. Road ecology and road density in different landscapes, with international planning and mitigation solutions. *In*: Evink, G., D. Ziegler, and J. Berry, (Eds). Proceedings of the Florida Department of Transportation/Federal Highway Administration Transportation-Related Wildlife Mortality Seminar. Orlando, Florida, April 30-May 2, 1996.

<sup>23</sup> Reudiger, B. 1996. The relationship between rare carnivores and highways. *In*: Evink, G., D. Ziegler, and J. Berry, (Eds). Proceedings of the Florida Department of Transportation/Federal Highway Administration Transportation-Related Wildlife Mortality Seminar. Orlando, Florida, April 30-May 2, 1996.

<sup>24</sup> Soule, M. 1987. Viable populations for conservation. Cambridge University Press: Cambridge, England.

- Continue the prohibition of operation of ATVs (All Terrain Vehicles) and other vehicles on seasonally closed (December 1<sup>st</sup> through April 30<sup>th</sup>) or decommissioned roads in Winter Range (reference District Access and Travel Management maps, Appendix C: Road Management Information), and 1990 Umpqua NF LRMP Appendix F.
- When closed roads are reopened, use minimal resource impact techniques. For example:
  - ✓ Keep clearing width to a minimum.
  - ✓ Avoid sidecasting clearing debris and rootwads.

**❖ ISSUE: Roads and associated human activities increase the spread of noxious weeds and non-native invasive plants.**

**CURRENT SITUATION**

The vast majority of the noxious weeds on the Forest, particularly the high-priority weeds, are found along roadsides. Noxious weeds are non-native, invasive plants that are designated by the State Weed Board. Weed abundance in these areas is often attributed to three factors:

- Level of initial disturbance from road construction resulting in extensive areas of mineral soil and exposed parent material that provide ideal sites for weed colonization;
- Frequent disturbance regimes as a result of regular road maintenance and use that provide opportunity for additional weed colonization and expansion of established populations; and
- Vehicles traveling the roads and other human activities along road corridors often transport weed seed or propagules into the area<sup>25</sup>.

Umpqua system roads currently support a significant and growing population of non-native invasive plants.

**RISKS AND BENEFITS**

The risk of weed introduction and spread posed by roads is a function of road use and maintenance level, and the proximity and biology of individual weed species. The greatest risk of weed infestation and transport is associated with Primary and Secondary roads that are regularly maintained for public use and new construction of “temporary” roads

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<sup>25</sup> Baker, H G. 1986. Patterns of plant invasion in North America. *In*: Mooney, H. A. and J. A. Drake, (Eds.). Ecology of biological invasions of North America and Hawaii. New York: Springer-verlag: 44-57.

associated with timber harvest activities. Roads that have been closed for many years so that tree or high shrub cover is restricting light penetration to the soil have fewer weeds<sup>26</sup>.

Noxious weeds on the Umpqua are stratified into different classes for treatment. The highest priority species are on the “A” list. These species generally have limited distribution on the Forest and are subject to intensive control or eradication where feasible. These species pose the greatest threat to the ecology of the Forest and the local economy. “B” list species are generally too widely distributed on the Forest to be efficiently treated by currently available intensive control methods. Isolated infestations and infestations threatening specific resource damage may be subject to intensive controls but populations at large are subject to less intensive methods such as biological controls or vegetative competition.

## RECOMMENDATIONS

- Assess the risk of noxious weed introduction or spread as part of the NEPA process for all proposed activities<sup>27</sup>.
- Minimize roadside sources of weed seed that could be transported to other areas.
- Periodically inspect system roads and rights-of-way for invasion or noxious weeds. Train road maintenance staff to recognize weeds and report locations to the local weed specialist. Inventory weed infestations and schedule them for treatment.
- Schedule and coordinate blading or pulling of noxious weed-infested roadsides or ditches in consultation with local weed specialist. Do not blade or pull roadsides and ditches that are infested with noxious weeds unless doing so is required for public safety or protection of the roadway. If the ditch must be pulled, ensure the weeds remain on-site. Blade from least infested to most infested areas. When it is necessary to blade noxious weed-infested roadsides or ditches, schedule activity when seeds or propagules are least likely to be viable and to be spread. Minimize soil surface disturbance and contain bladed material on the infested site.
- Avoid acquiring water for dust abatement where access to the water is through weed-infested sites.
- For timber sale purchaser road maintenance and decommissioning, use contract provisions for equipment cleaning such as WO-C/CT 6.36, Appendix 1.
- For road maintenance and decommissioning conducted as part of public works (construction and reconstruction) contracts and service contracts, include contract language for equipment cleaning such as in WO-C/CT 6.36, Appendix 1.

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<sup>26</sup> Parendes, L. A. and J. A. Jones. 2000. Role of Light Availability and Dispersal in Exotic Plant Invasion along Roads and Streams in the H.J. Andrews Experimental Forest, Oregon. *Conservation Biology* 14(1): 64-75.

<sup>27</sup> USDA Forest Service. 1995. Forest Service Manual 2000: National Forest Resource Management, WO Amendment 2000-95-5. 2080.44.6: Weed Management, District Ranger Responsibility, 11/29/1995.

- Treat weeds in road decommissioning, restoration, and reclamation projects before roads are made impassable. Re-inspect and follow-up based on initial inspection and documentation. Require equipment cleaning for:
  - ✓ All heavy equipment brought onto the Forest;
  - ✓ All heavy equipment moved from noxious weed infested areas to uninfested areas; and
  - ✓ All vehicles driving off road.
- Heavy equipment cleaning should apply to all contract, force account, cooperator, and special use equipment, and would apply to tractors, mowers, graders, and other equipment, including vehicles and ATVs that have been used off the road surface.
- Provide for revegetation of disturbed sites using native species (reference Umpqua native seed policy).
- Maintain existing canopy cover to the extent possible when designing new roads or marking clearing limits for temporary roads.
- Use only certified weed-free seed for roadside revegetation. Seed purchased should be tested using the All States Noxious Weed List.
- Consider development of a quarry certification program and use only weed-free rock sources for road construction and maintenance.
- Close Forest roads not needed in the foreseeable future. Blocked roads and roads that are storm-proofed and allowed to grow-in are at a much lower risk for weed invasion and transport than maintained roads.

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## GLOSSARY

**Access and Travel Management (ATM)** - Plans and strategies for the implementation of objectives, prescriptions, and operation plans for providing access and travel opportunities in the forest. It is not new idea or process. ATM considers and coordinates all resource needs, user groups, modes of travel, economic and legal issues, traffic and safety requirements, and agrees with both National and Regional policy using the Forest's ATM Plan in conjunction with the Forest Land & Resource Management Plan as a guiding document. ATM is dynamic, for it constantly responds to changing public, economic, land and resource management needs. Reference Appendix F of the Umpqua Land and Resource Management Plan (1990).

**All-Terrain Vehicle (ATV)** - A vehicle able to negotiate most lands of terrain through traction devices such as wide tracts, large low-pressure rubber tires, and/or four-wheel drive. (See ORV.)

**Arterial Roads** - Primary travel routes that provide service to a large land area. They usually connect with public highways, or other Forest Service arterial roads.

**Bridge** - A road or trail structure, including supports, erected over a depression or an obstruction, such as water, a road, a trail, or railway, and having a deck for carrying traffic or other loads.

**Classified Road** – Roads wholly or partially within or adjacent to National Forest System lands that are determined to be needed for long-term motor vehicle access, including State roads, county roads, privately owned roads, National Forest System roads, and other roads authorized by the Forest Service (36 CFR 212.1).

**Closed Roads** - A road on which traffic has been excluded by natural blockage, barricade, regulation, or by obscuring the entrance. A closed road is still an operating facility on which traffic has been removed (year-long or seasonal) and remains a National Forest system road.

### **Regulated Use (Gated Roads)**

**“Seasonally Closed”/Prohibited Use:** These roads are closed part of the year to publics with a gate, sign or other device for purposes of wildlife management, recreation use or other resource management reasons. While some may be maintained for passenger cars, most of these roads are maintained for high-clearance vehicle use. In those cases where resource management or access and travel plans have identified an administrative need, such as user conflicts, safety hazards, fire control or special use access, the road will still be maintained, but closed with a gate or other removable device. Prohibited use signs will be posted on these devices. The road is closed by an “order” pursuant to 36 CFR part 261.

### **Restricted Use/Eliminate Use**

**“Closing Naturally”:** These roads serve no identified access need, and are not causing resource damage. Therefore, they do not require immediate closure with some sort of device. Closure will occur gradually. The road will first be stabilized; however, brush will not be cut or slumps and rockfall removed unless resource

damage is occurring. The lack of maintenance will eventually result in the road becoming impassible to motor vehicles.

**“Closed With A Device”:** These roads are closed to publics year-round, but will remain on the road system for potential use in the future. In those cases where resource management or access and travel plans have not identified an administrative traffic need, the road is dosed to all traffic, public and administrative, and access is controlled by permanent devices or a natural barricade. These roads will also be stabilized. The road is placed in Level 1 road maintenance.

**Code of Federal Regulations (CFR)** - Contains traffic management and traffic engineering requirements that the Forest Service must follow in the management and operation of national forest roads. (See 36 CFR parts 212 and 261).

**Collector Roads** - Roads that serve small land areas and usually connect with National. Forest arterial roads or public highways. They collect traffic from local roads and terminal facilities.

**Cultural Resource** - Any definite location of past human activity identifiable through field survey, historical documentation or oral evidence. This includes archaeological and architectural sites or structures, and places of traditional cultural or religious importance to specified groups whether or not represented by physical remains.

**Decommission** – To perform activities that result in the stabilization and restoration of unneeded roads to a more natural state (36 CFR 212.1), (FSM 7703).

**Developed Recreation** - Recreation that requires facilities, resulting in concentrated use of an area. An example of a developed recreation site is a campground, trailhead, day use area, boat ramp, etc. Facilities might include roads, parking lots, picnic tables, toilets, drinking water, and buildings.

**Drainage** - In this document, drainage refers to a culvert, which is a conduit or passageway under a road, trail or other facility.

**Debris Avalanche** – A shallow-seated (<5 meters depth) rapid-moving landslide that results from failure of a highly saturated mass of soil, rock, and organic debris under the direct influence of gravity.

**Debris Flow** – A shallow-seated (<5 meters depth) rapid-moving landslide confined to a stream channel that consists of a large volume of water (slurry) charged with soil, rock, and organic debris. Stream channels that are impacted by a debris flow have scour, transport, and depositional reaches.

**Decommission** - To remove those elements of a road that reroute hillslope drainage and present slope stability hazards. The intention is not full restoration of ground contours, but to minimize disruption of natural, hydrologic flow paths, including diversion of stream flow and interception of surface and subsurface flow.

Decommission involves:

- ✓ Closing entrances - preferably using full-restoration techniques to obscure.
- ✓ Scarifying road surfaces, or decompacting (subsoiling) to establish vegetation and reduce run-off.
- ✓ Seeding to control erosion and in some cases provide forage.
- ✓ Partial to full restoration of stream channel by removing culverts and fills.
- ✓ Waterbarring and cross-ditching of roadbed.

- ✓ Removing unstable portion of embankments.

Reference FSM 7731.14.

**Dispersed Recreation** - A general term referring to recreation use outside developed recreation sites. This includes activities such as scenic driving, hiking, bicycling, backpacking, hunting, fishing, snowmobiling, horseback riding, cross-country skiing, and recreation in primitive environments.

**District** - (Ranger District). A geographic administrative subunit of the Forest. Districts are Cottage Grove, Tiller, North Umpqua, and Diamond Lake.

**Earthflow Terrain** – A landscape that is characterized by the presence of slow moving, deep-seated (>5 meters depth) mass movement landforms including rotational slumps, earthflows, and related soil creep. Collectively, these mass movement landforms from complexes up to several thousand acres in extent with individual features exhibiting varying levels of activity ranging from dormant (inactive) to highly mobile (very active). Areas of semi-active to active slope movement are mainly confined to headwall scarps and toe zones that abut stream channels. Earthflow terrain represents a deeply weathered mass movement landscape formed over periods involving thousands to hundreds of thousand years.

**Ecosystem** - A complete, interacting system of organisms considered together with their environment--e.g., a marsh, a segment of a stream, or a lake.

**Ecosystem Management** - Using an ecological approach to achieve the multiple-use management of National Forests and Grasslands by blending the needs of people and environmental values in such a way that National Forests and Grasslands represent diverse, healthy, productive, and sustainable ecosystems.

**Engineering Judgment** – The evaluation of available pertinent information, and the application of appropriate principals, standards, and guidelines, and practices as contained in agency manuals or other sources, for the purpose of deciding upon the applicability, design, operation, or maintenance of roads or facilities. Engineering judgement will be exercised by an engineer, or by an individual working under the supervision of an engineer, through the application of procedures and criteria established by the engineer. Documentation of engineering judgement is not required.

**Environmental Assessment (EA)** - A systematic analysis of site-specific activities used to determine whether such activities have a significant effect on the quality of the human environment and whether a formal environmental impact statement is required; and to aid an agency's compliance with the National Environmental Policy Act when no environmental impact statement is necessary.

**Federal Highway Administration (FHWA)** - The federal public road authority responsible for federal highways to be open to public travel and commerce. This program is administered by the U.S. Department of Transportation.

**Forage** - All browse and non-woody plants harvested for feed or available to livestock or wildlife for grazing.

**Forest Ecosystem Management Assessment Team (FEMAT)** - A team that developed a report titled "Forest Ecosystem: An Ecological, Economic and Social Assessment" commonly referred to as "the FEMAT Report." The FEMAT is Appendix A of the Final Environmental Impact Statement (FEIS), on Management for Late-

Successional and Old-Growth Forest Related Species Within the Range of the Northern Spotted Owl.

**Forest Plan** - The Umpqua's Land and Resource Management Plan which "...provide(s) for multiple use and sustained yield of goods and services from the National Forest System in a way that maximizes long-term net public benefits in an environmentally sound manner."

**Forest Roads** - As defined in Title 23, Section 101 of the United States Code (23 U.S.C. 101), any road wholly or partly within, or adjacent to, and serving the National Forest System and which is necessary for the protection, administration, and utilization of the National Forest System and the use and development of its resources.

**Forest Service Manual (FSM)** - A manual that provides a unified system for issuing, storing, and retrieving all continuing direction that governs Forest Service programs and activities. The manual sets forth legal authorities, management objectives, policies, responsibilities, delegations, standards, procedures and other instructions that are continuing and that apply to or are needed by more than one unit.

**Forest Transportation Facility** - A classified road, designated trail, or designated airfield, including bridges, culverts, parking lots, log transfer facilities, safety devices and other transportation network appurtenances under Forest Service jurisdiction that is wholly or partially within or adjacent to National Forest System lands (36 CFR 212.1).

**Forest Transportation System Management** - The planning, inventory, analysis, classification, recordkeeping, scheduling, construction, reconstruction, maintenance, decommissioning, and other operations undertaken to achieve environmentally sound, safe, cost-effective, access for use, protection, administration, and management of National Forest System lands.

**Guideline** – a statement of recommended, but not mandatory, practice in typical situations, with deviations allowed if engineering judgment or engineering study indicates the deviation to be appropriate.

**Highway Safety Act of 1966 (P.L. 89-564)** - Directs states and participating agencies to identify and survey accident locations; to design, construct, and maintain roads in accordance with safety standards; to apply sound traffic control principles and standards; and promote pedestrian safety. This Act applies to National Forest System roads that have operation and maintenance levels of "3" to "5" (roads suitable for passenger cars).

**Hydrologic** - Describing quantity, quality and timing of water yield.

**Inholding** – Private land belonging to one landowner that exists within a block of land belonging to another. For example, small parcels of private land exist within national forest boundaries.

**Interdisciplinary Team (IDT)** - A group of individuals with varying areas of specialty assembled to solve a problem or perform a task. The team is assembled out of recognition that no one scientific discipline is sufficiently broad enough to adequately analyze the problem and propose action.

**Key Watershed** - A watershed as identified in the Northwest Forest Plan, containing (1) habitat for potentially threatened species or stocks of anadromous salmonids or other

potentially threatened fish, or (2) greater than six square miles with high-quality water and fish habitat.

**Landing** - Any place on or adjacent to a logging site where logs are assembled for further transport.

**Long Term** - In context of these guidelines, 10 years and beyond.

**Maintenance Levels** - Defines the level of service provided by, and maintenance required for, a specific road, consistent with road management objectives and maintenance criteria (reference FSH 7709.58 and FSH 7709.59):

Maintenance Level 1 - Assigned to intermittent service roads during the time they are closed to vehicular traffic. The closure period is one year or longer. Basic custodial maintenance is performed.

Maintenance Level 2 - Assigned to roads open for use by high clearance vehicles. Passenger car traffic is not a consideration.

Maintenance Level 3 - Assigned to roads open and maintained for travel by a prudent driver in a standard passenger car. User comfort and convenience are not considered priorities.

Maintenance Level 4 - Assigned to roads that provide a moderate degree of user comfort and convenience at moderate travel speeds.

Maintenance Level 5 - Assigned to roads that provide a high degree of user comfort and convenience. Normally, roads are double-lane and paved, or aggregate surfaced with dust abatement.

**Management Area** - For purposes of this guide are geographic areas designated or described by certain resource and land allocations contained in current Forest Plan and subsequent area or landscape plans.

**Manual on Uniform Traffic Control Devices (MUTCD)** - For streets and highways as approved by the Federal Highway Administration as the National Standard in accordance Title 23, U.S. Code. These standards usually apply to roads subject to the Highway Safety Act, Maintenance levels 3-5 (reference FSH 7709.58).

**Monitoring** - The process of collecting information to evaluate if objective and anticipated or assumed results of a management plan are being realized or if implementation is proceeding as planned.

**National Environmental Policy Act (NEPA) of 1969** - An Act to declare a National policy which will encourage productive and enjoyable harmony between humankind and the environment, to promote efforts which will prevent or eliminate: damage to the environment and biosphere and stimulate the health and welfare of humanity, to enrich the understanding of the ecological systems and natural resources important to the nation, and to establish a Council on Environmental Quality. (The Principal Laws Relating to Forest Service Activities, Agriculture Handbook No. 453, USD, Forest Service, 359 pp.)

**National Forest Management Act (NFMA)** - A law passed in 1976 as an amendment to the Forest and Rangeland Renewable Resources Planning Act, requiring the preparation of forest plans and the preparation of regulations to guide that development.

**National Forest System Road** A classified forest road under the jurisdiction of the Forest Service. The term “National Forest System roads” is synonymous with the term “forest development roads” as used in 23 U.S.C. 205.

**New Road Construction** Activity that results in the addition of forest classified or temporary road miles (36 CFR 212.1).

**Northwest Forest Plan** - Option 9 of FEMAT. Alternative 9 and the preferred alternative of the DSEIS, sometimes referred to as the Forest Plan (not to be confused with the National Forest Management Act of 1976 (NFMA) definition of a Forest Plan). The Record of Decision (ROD) for the NWFP was signed in 1994. Umpqua NF Plan is amended by the ROD for the NWFP.

**Off-Road Vehicle (ORV)** - Any motorized track or wheeled vehicle designed for cross-country travel over natural terrain (e.g., motorcycles, all-terrain vehicles, four-wheeled drive vehicles, and snowmobiles). (See ATV)

**Partnership** - In the context of these guidelines, partnerships are those alliances between individuals, groups and/or government that enable road and trail maintenance or monitoring activities beyond that required for resource management access alone. Partnerships (1) foster good stewardship within the land management plan (2) are not exclusive but serve the user public at large, and (3) benefit all parties involved.

**Project** - An organized effort to achieve an objective, identified by location, activities, outputs, effects, and time period and responsibilities for execution.

**Public Involvement** - A Forest Service process designed to broaden the information base upon which agency decisions are made by (1) informing the public about Forest Service activities, plans and decisions, and (2) encouraging public understanding about and participation in the planning processes leading to final decision making.

**Public Road** – (reference FSM 7705).

**Recreation Opportunity Spectrum (ROS)** - Land delineations that identify a variety of recreation experience opportunities. They are categorized into six classes: Primitive, Semiprimitive Nonmotorized, Semiprimitive Motorized, Roaded Natural, Rural, and Urban.

**Regional Network** - A system of Forest Development roads considered significant for providing access and travel within the Pacific Northwest Region of the Forest Service. The primary criteria for these roads is that publics will be encouraged to use them for access to national forest lands and they will be shown on state highway maps.

**Regulated Use** - Regulated use is the active form of facility management using regulations and appropriate enforcement to secure and ensure user compliance with management direction. (e.g., Gate closures prohibiting designated use by legal order, 36 CFR 261)

**Restricted Use** - Restricted use is a passive form of road management relying on (1) voluntary user compliance with signs provided at or on the facility, or (2) commercial user compliance with contractual requirements outlined therein.

**Riparian Area** - A geographic area containing an aquatic ecosystem and adjacent upland areas that directly affect it. This includes floodplains, woodlands, and all areas

within a specified distance from the normal line of high water of a stream channel or from the shoreline of a standing body of water.

**Road** - A general term denoting a facility for purposes of travel by vehicles greater than 50 inches in width. Includes only the area occupied by the road surface and cut and fill slopes (FSM 2355.05). Types of roads include:

**Classified Roads** - Roads wholly or partially within or adjacent to National Forest System lands that are determined to be needed for long-term motor vehicle access, including State roads, county roads, privately owned roads, National Forest System roads, and other roads authorized by the Forest Service (36 CFR 212.1).

**Forest Road** - A road wholly or partly within, or adjacent to, and serving the national forest system and which is necessary to protect, administer, and use the national forest system and its resources (23 USC 660.103).

**Forest Highway** - A forest road that is open to public travel, and which is under the jurisdiction of and maintained by a public road authority. The Forest Service is not a public road authority ( 23 USC 660.105).

**Private Road** - A road within the National Forest System that is not necessary to protect, administer, or, use the national forest system or its resources. (An example might be a permanent road to access private inholdings.) These roads can be authorized under various land use authorizations.

**Public Roads** - Any road or street under the jurisdiction of and maintained by a public authority and open to public travel (23 U.S.C. 101(a)).

**Temporary Road** - Roads authorized by contract, permit, lease, other written authorization, or emergency operation not intended to be a part of the forest transportation system and not necessary for long-term resource management (36 CFR 212.1) (FSM 7705).

**Unclassified Roads** - Roads on National Forest System lands that are not managed as part of the forest transportation system, such as unplanned roads, abandoned travelways, and off-road vehicle tracks that have not been designated and managed as a trail; and those roads that were once under permit or other authorization and were not decommissioned upon the termination of the authorization (36 CFR 212.1).

**Road Decommissioning** - Activities that result in the stabilization and restoration of unneeded roads to a more natural state (36 CFR 212.1), (FSM 7703).

**Road Maintenance** - The ongoing upkeep of a road necessary to retain or restore the road to the approved road management objective (FSM 7712.3).

**Road Management Objective (RMO)** - Defines purpose, use, operational and maintenance level of road based on resource management and access and travel management objectives.

**Road Reconstruction** - Activity that results in improvement or realignment of an existing classified road as defined below:

**Road Improvement** - Activity that results in an increase of an existing road's traffic service level, expands its capacity, or changes its original design function.

**Road Realignment** - Activity that results in a new location of an existing road or portions of an existing road and treatment of the old roadway (36 CFR 212.1).

**Road Upgrading** - Includes erosion controls and prevention work on roads to remain open.

**Roadless Area** - Area identified during the Roadless Area Review and Evaluation process (RARE II) which have no roads and are at least 5,000 acres in size.

**Roads subject to the Highway Safety Act** - National Forest System roads that are open to use by the public for standard passenger cars. This includes roads with access restricted on a seasonal basis and roads closed during extreme weather conditions or for emergencies, but which are otherwise open for general public use.

**Safety Management System** – (reference FSM 7733.2)

**Short Term** - In context of these guidelines, less than 10 years.

**Stabilization** - A process to slope, dip and waterbar travelways to reduce run-off concentrations and alleviate risk of erosion and landslides, should designed drainage structures fail to cant' storm event. This also includes grass seeding slopes. Unstable fill embankments that exceed the required travelway may be partially or fully removed.

**Standard** – a statement of required, mandatory, or specifically prohibitive practice regarding land management, safety, or other procedures.

**Stormproofing** - See Stabilization.

**Threatened Species** - Those plants or animal species likely to become endangered throughout all or a significant portion of their range within the foreseeable future.

**Traffic Management Strategy** - Please see Tables 1 & 2. (Reference FSM 7731.11).

**Travelway** - A way for passage of vehicles, conveyances, persons, or domestic livestock (stock driveways & horse trails), developed by construction or use.

**Viewshed** - The landscape that can be directly seen from a viewpoint along a transportation corridor.

**Water Bar** - Berm or ditch and beret combination that cuts across roads (and trails) at an angle so that all surface water running on the road and in the road ditch is intercepted and deposited over the outside edge of the road. These normally allow high clearance vehicles to pass.

**Watershed** - The drainage basin contributing water, organic matter, dissolved nutrients and sediments to a stream or lake.

**Watershed Analysis (WA)** - Identifies key processes, functions and conditions within a watershed and describes past and current conditions and trends. This is an analytical process, which creates a tool to help identify and prioritize actions that implement Forest plans. Watershed analysis is ecosystem analysis at the watershed scale. (Reference Federal Guide for Watershed Analysis.)

**Watershed Restoration** - Improving current conditions of watersheds to restore degraded fish habitat and provide long-term protection to aquatic and riparian resources. (Reference Umpqua National Forest Watershed Restoration Business Plan, updated 2003).