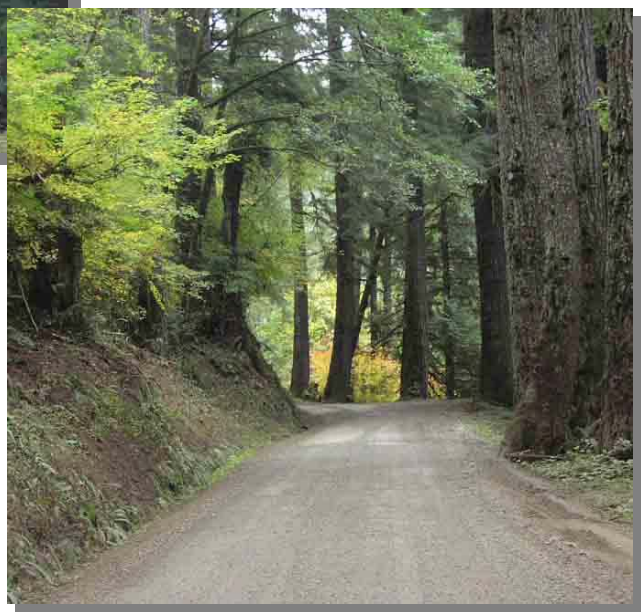
Siuslaw National Forest

Road Analysis Report

Analysis: Forest-Scale



January 2003

EXECUTIVE SUMMARY

The Siuslaw National Forest has undergone enormous change since 1990. With implementation of the Northwest Forest Plan in 1994, the Forest went from a program of intensive timber management providing an annual timber harvest of over 300 million board feet, to a program composed of riparian and late-successional reserves with a harvest of 25 million board feet. This change reversed decades of road system expansion and led the Siuslaw to evaluate the strengths and liabilities of its entire road network.

In 1994, following extensive public involvement efforts, the Forest issued an Access and Travel Management (ATM) guide that identified the basic primary and secondary road system deemed essential for public access and travel throughout the Forest. The primary and secondary road system comprised about one third of the road network, leaving the other two thirds of the system open to question. Due to reduced timber harvest, road maintenance funds became scarce, forcing the Forest to make choices about which non-primary and non-secondary roads to maintain or close.

In 1996, an intense rainstorm hit Oregon causing numerous landslides, floods, and debris flows. The Forest seized the opportunity to learn from this natural phenomenon and teamed up with researchers from the Pacific Northwest Research Station (PNW) to study environmental effects. Studies revealed a complex interaction between floods and roads culminating in the Assessment of the Effects of the 1996 Flood on the Siuslaw National Forest (USDA 1997). This report confirmed much of what was suspected about the effect of severe storms on roads, *i.e.,* a smaller number of failures occurred on roads that had been waterbarred or decommissioned (primarily due to inadequate culverts) previous to the storm event.

At the same time, the production of a video called “Torrents of Change” (FSEE 1996) indicated a high level of public interest in the status of forest roads. Since then, the Forest has embarked on an aggressive program of stream and forest restoration with road management at the forefront.

In the interim, watershed analyses were completed for nearly the entire Siuslaw. All of these assessments have recognized the significance of roads and their impact on the environment. Most have made recommendations regarding specific roads and their future management. Many roads have been decommissioned or otherwise hydrologically stabilized and closed as a result of these analyses.

This roads analysis is not a decision, but rather a compilation of information useful for making informed decisions about road management. It has two primary objectives. First, to take a look at the Key Forest Routes (the primary and secondary road system) and validate its continued use as a tool for making decisions about road management. Second, to capture the cumulative knowledge that we’ve gained from years of studying roads and road management in order to better inform land managers about the benefits and liabilities of roads, ways to mitigate risks, and sources of additional information.

To accomplish this task an interdisciplinary team used the Forest Service publication *Roads Analysis: Informing Decisions About Managing the National Forest Transportation System* (USDA 1999). The team followed the six-step process outlined in this document and used its list of 71 Ecologic, Economic and Social considerations in order to identify issues specific to the Siuslaw. The team found that many of the suggested road issues are best addressed at the watershed or project scale rather than the Forest scale. Other issues were not found to be important in making road decisions pertinent to the Siuslaw. The Team’s responses to those considerations are listed in Appendix A, page 45. In all, eight issues were found to be important for informing road decisions on the Siuslaw:

- **Economic** – Low maintenance funding affects our ability to maintain key access routes.
- **Community Impact –** People depend on Forest roads for safe travel and Forest access.

- **Aquatics and Water Quality** – Roads influence hydrologic function and stream dynamics.
- **Fisheries** – Roads affect fish habitat and fish passage.
- **Terrestrial Wildlife** – Roads affect wildlife through fragmentation and disturbance.
- **Vegetation Management** – Road access is critical for creating desired forest characteristics.
- **Noxious Weeds** – Roads and people can increase the spread of noxious weeds.
- **Wildfires and Fire Suppression** – Roads influence both wildfire occurrence and suppression.

Each of these issues is discussed in detail in Chapter 4, Issues (page 10). Each issue has a discussion of the current situation, risks and benefits, desired future conditions, and recommendations. Recommendations concerning all issues are summarized in Chapter 5, Key Recommendations (page 35). 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 (page 93).

We are still learning about roads and the complex interaction of people and environment that they afford. This roads analysis captures what we know to be important today. As we learn more about roads through monitoring and site-specific analysis, these recommendations, including the primary and secondary road system itself, will undoubtedly change. If changes are needed, adjustments or modifications to the Key Road system can be addressed at the appropriate scale.

When taken as a whole, the recommendations of this report inform readers concerning the critical issues related to road management on the Siuslaw. It is our hope that the recommendations herein will lead to wise choices in road management in the future.

US Highway 101 viewed from Cape Perpetua viewpoint

1 INTRODUCTION

Background

On January 12, 2001, the Forest Service issued the final National Forest System Road Management Rule. This rule revised regulations concerning the management, use, and maintenance of the National Forest Transportation System. The 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.

Since 1994, road management decisions on the Siuslaw have been guided by the Siuslaw Access and Travel Management Guide (Appendix B, page 59), which established a system of prioritized Key Roads. This system has provided the basis for making site-specific decisions concerning road management on the Siuslaw for over eight years. Road management decisions have also been informed by watershed analyses that focused largely on roads and their impacts on terrestrial and aquatic restoration efforts. The Forest is currently focused on restoration of aquatic and terrestrial ecosystems and has been a leader in addressing problems and issues presented by roads.

This analysis is designed to provide decision-makers with important information to develop road systems that are safe and responsive to public needs and desires, are affordable and efficiently managed, have minimal negative ecological effects on the land, and are in balance with available funding for needed management actions. This report documents the information and analysis procedure used for the Siuslaw national Forest roads analysis.

A Word About Scale

There are multiple scales at which roads analysis may be conducted to inform road management decisions. Generally, road management decisions should be informed by roads analysis at a broad scale such as the Forest or Province level. The Responsible Official (District Ranger or Forest Supervisor) has the discretion and duty to determine whether or not a roads analysis below the Forest-scale is needed and the degree of detail that is appropriate and practicable. 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 7712.13, paragraphs a-c (USDA 2001a).

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, 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.

Another element of scale is time. Currently the Siuslaw is scheduled to begin Forest Plan Revision in 2009. Plan Revision will include a roads analysis and is likely be completed by 2013. It is expected that this roads analysis will serve its purpose until that time (or about ten years).

Objectives of the Analysis

1. To take a look at the current Key Road network and system of prioritizing road maintenance based on criteria for primary and secondary designations, and validate its continued use as a tool for making decisions about road management.
2. To capture the cumulative knowledge and wisdom that we've gained from years of studying roads and road management in order to better inform land managers making site-specific decisions about roads.

What this Analysis Does *NOT* Do

1. This analysis will not make site-specific decisions about which roads should be closed. Those decisions are made at the project scale with public input on site-specific situations.
2. This analysis is not a decision document. Recommendations and findings will only be used to inform decisions at higher or lower scales. They are not standards or guidelines under the Siuslaw Forest Plan. Recommendations and findings are subject to change as new or better information becomes available.
3. This analysis does not address off-road vehicle (ORV) use on the Oregon Dunes National Recreation Area. That decision was made in the Record of Decision for the Dunes Management Plan (1994). ORV use at Sand Lake is addressed in the Sand Lake Management Plan (1980).

The Analysis Process

An interdisciplinary team composed of resource and technical specialists conducted the Siuslaw Roads Analysis. The team relied on the Forest Service publication FS-643, *Roads Analysis: Informing Decisions About Managing the National Forest Transportation System* (USDA 1999) for conducting the analysis. FS-643 outlines a six-step procedure. These steps are designed to be sequential with the understanding that the process may require feedback and iteration among steps over time as an analysis matures.

1. **Setting up the analysis** – includes setting objectives and planning the analysis.
2. **Describing the situation** – includes describing the current road management system and current road network.
3. **Identifying issues** – uses a list of 71 considerations described in FS-643 to help identify a subset of key issues specific to road management on the Forest.
4. **Assessing Benefits, Problems and Risks** – where each issue is viewed within the context of the road system with problems and benefits of the system assessed.
5. **Describing opportunities and setting priorities** – management opportunities and technical recommendations are developed to address the benefits, problems and risks identified.
6. **Reporting** – documentation of the process, key findings, and recommendations. For the sake of clarity, in this report, steps 3, 4 and 5 have been blended into Chapter 4, Issue Analysis. The 71 considerations listed in FS-643 are addressed in Appendix A. Key Recommendations are found in Chapter 5, Key Recommendations.

Interdisciplinary Team Members and Contributors

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Road with stream crossing

2 DESCRIBING THE SITUATION

Existing Road and Access System Description

Currently, the Siuslaw National Forest has about 2,280 miles of roadway and approximately 700 miles of state and county roads within its boundaries. Cars, trucks, motorcycles, bicycles, and other modes of transportation traverse these many roads for recreation, resource management projects, and private property use. This variety of uses and demands makes management of the Forest transportation system a complex task. The Forest must provide many different recreational experiences and management opportunities, and at the same time protect resources, minimize safety hazards, and reduce user conflicts.

Historically, the Siuslaw National Forest emphasized timber management. This emphasis resulted in a large road system designed to access timber and other forest resources. The growth of the road system is represented by Figure 1, which depicts the growth of roads in the North Fork Siuslaw watershed from 1952 through 1994. Similar trends were seen throughout the Forest during the same time period.

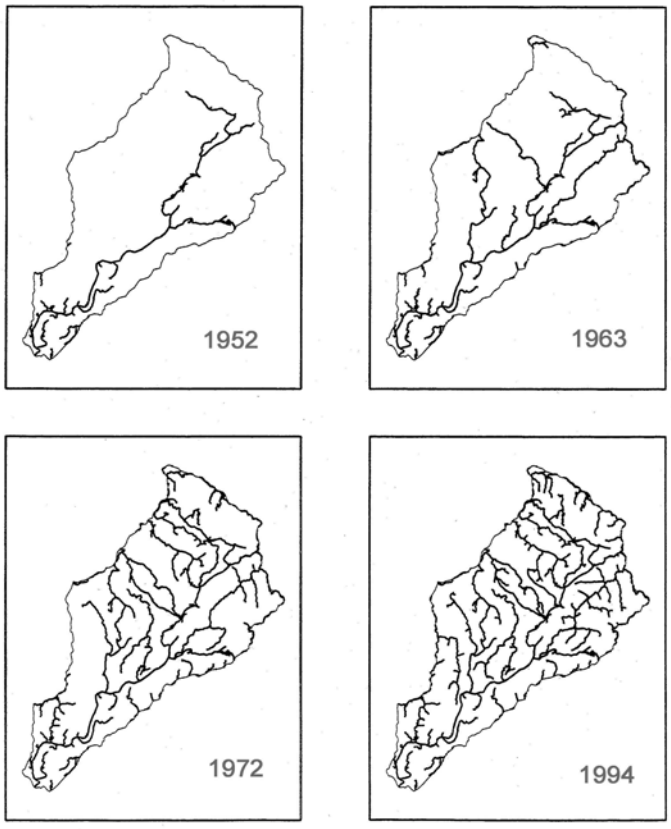


Figure 1. Growth of the Forest Road System in the North Fork Siuslaw watershed

Under the Siuslaw Land and Resource Management Plan (USDA 1990), the Forest was poised to continue harvesting over 300 million board feet per year with continual use and growth of the road network. However, beginning in the early1990s, timber harvest declined dramatically with listing of the northern spotted owl (*Strix occidentalis*) and the marbled murrelet (*Brachyramphus marmoratus*). Both species were listed as "threatened" under the Endangered Species Act.

Subsequently, the Northwest Forest Plan (USDA, USDI 1994) amended the Siuslaw Forest Plan and radically changed management direction on the Forest. Instead of the system of intensively managed tree plantations envisioned in 1990, the Forest was to become a system of large late-successional and riparian reserves, where timber harvest was largely a by-product of efforts to restore late-successional or "old growth" conditions. This change reduced the annual timber harvest from 345 to 25 million board feet.

An indirect effect of this harvest reduction was a drastic reduction in the Forest's ability to maintain the 2,500 miles of system roads. Traditionally, a portion of timber sale receipts was used to fund road maintenance and, in some cases, timber purchasers performed road maintenance with their own equipment. The reduction in timber harvest meant there would be insufficient funds to maintain all the roads in service. Without maintenance, roads are more prone to erosion, washouts and

landslides. Culverts can become plugged creating small dams of water that can burst, sending sediment downstream, ruining salmon spawning grounds.

The Forest was faced with a dilemma. Realizing that most of the road system could not be maintained and that risks of road failures were increasing, what could the Forest do to stabilize roads and still provide access essential for commerce, safety and recreation access? Clearly, only a limited number of roads could be maintained to standard and many other roads would need to be closed or stabilized to minimize maintenance requirements.

To meet this challenge, the Forest began storm proofing some roads by waterbarring in 1991. Two years later, in July 1993, the Forest began to develop an Access and Travel Management (ATM) Guide that would identify a Key Road system composed of primary and secondary roads. The Key Road system would include access routes for administrative and public travel on Forest Service lands, including connections to the county, state and federal highways. Primary roads would get highest priority for funding followed by secondary roads and then "other" roads. Interested and affected publics were informed that the Siuslaw would need to reduce its open road network to less than 1,000 miles from the then-current 2,500 miles. In August 1993, public workshops were held in Florence, Corvallis and Lincoln City to define criteria for identifying primary and secondary roads. By March 1994, public involvement was completed and a map showing the Key Road system of primary and secondary roads was completed. Use of the selection criteria in the ATM Guide resulted in a Key Road network very similar to the road network of the 1960s, prior to development of the more extensive logging road system.

Appendix B, page 59, contains a copy of The Siuslaw Access and Travel Management Guide, September 1994. This guide identified a network of 630 miles of Key Roads and provided a framework for reviewing the road network during watershed and project planning. Existing Forest roads not selected as primary or secondary roads were to be evaluated at the watershed or project scale to determine whether they should remain intermittent-use roads (with long-term access not maintained for public travel) or be decommissioned and removed from the system.

Following adoption of the ATM road strategy the Forest began an aggressive program of waterbarring non-Key Roads to prevent rain runoff from running down wheel tracks and causing erosion. These water bars were much deeper than waterbars typically used to divert water off road surfaces and rendered the treated road non-drivable by passenger cars. Without regular maintenance to clear brush, such roads were expected to grow over with vegetation after a few years. This strategy developed as a result of the Forest's experience with failed culverts and road damage during heavy winter rains in the Coast Range. Following severe storms and flooding in 1996, the Forest conducted an assessment of flood effects (USDA 1997). The assessment confirmed the effectiveness of the waterbar strategy. The vast majority of road damage from severe storms was on roads (including the Key Road network) that had not been treated with deep waterbars.

The expectation was that the Key Road system developed under ATM guidelines would remain dynamic, based on new or changing information. Since adoption of the ATM guidelines for selecting Key Roads, project and watershed level planning efforts (in addition to changed conditions on some selected roads) have resulted in changes to the original primary and secondary road selections. Two examples of such changes are summarized below.

- **Road 1900**. The 1900 road system accesses the Drift Creek Organizational Camp on the Hebo Ranger District and was designated a Key Forest Route. Heavy rainfall and runoff during the 1996 and 1997 winter storms caused slides and washouts along the 1900 road, which made it impassable. Rather than attempt extensive repairs, the road was decommissioned and traffic rerouted to the 1924 road. The 1924 road was subsequently upgraded from a non-Key Road under ATM guidelines to a primary low clearance road. By using the 1924 road and stabilizing the 1900 road, access to the Drift Creek Organizational Camp was retained at a net savings in repair cost and reduced environmental risk.

⇨ **Road 63.** Road 63 was a designated Key Forest Route adjacent to Deadwood Creek on the Mapleton Ranger District. In order to improve fisheries habitat and reduce aquatic impacts along the main stem of Deadwood Creek, Road 63 was proposed for partial decommissioning. However, it was important to maintain access to the upper Deadwood Creek area.

The Upper Deadwood Creek Restoration Project Environmental Analysis (USDA 2001c) considered alternate routes through the area. Roads 3500 and 3515 roughly paralleled Road 63; both met the access needs and general criteria for selection as a primary low clearance Key Forest Road. However, Road 3515 was considerably less costly to upgrade and maintain for use by passenger vehicles. Analysis of the environmental, economic and access issues resulted in selecting Road **3515** as the replacement Key Forest Road, since it was the least costly, most stable road in the area.

Total system road mileage has declined due to decommissioning roads not selected as part of the Key Road system. These roads receive a variety of treatments to stabilize them, restore hydrologic function, and remove the road from the drivable Forest network. The majority of these decommissioned roads were short logging spurs not needed for current management or access. Other decommissioned roads were those presenting a high risk of resource damage, primarily along mid-slope and valley bottom sections that adversely impact aquatic resources. Table 1 illustrates how the system has changed since 1990.

Table 1. Comparison of Forest transportation system. Mileages are approximate; 2002 data reflects changes in Key Road selections and decommissioning of system roads over time.

DATA YEAR	TOTAL MILES SYSTEM ROADS	KEY PRIMARY & SECONDARY MILES LOW CLEARANCE[1]	KEY SECONDARY MILES HIGH CLEARANCE[2]	TOTAL MILES MAINTAINED[3]	MILES NOT REGULARLY MAINTAINED
1990	2530	-	-	2530	0
1994 ATM Guide Adoption	2500	300	330	750	1750
Current status – 2002 –	2280[4]	290	400	770	1510

[1] Suitable for passenger car travel.

[2] Suitable for standard pick-up truck travel.

[3] Includes closed and administrative roads not on the Key Road system.

[4] Reduction in total miles reflects decommissioning. Road decommissioning was evaluated through the NEPA process, which incorporated ATM guidelines.

Today, the Siuslaw National Forest is committed to terrestrial and aquatic restoration while considering the role, importance, and interdependency of all resources, including people. Roads Analysis reflects this commitment and the philosophy that the Forest and its travel corridors are open unless designated otherwise. However, the Forest's operating budget has been seriously reduced impacting its ability to maintain an extensive road system. Therefore, some roads will continue to be removed from the system, some closed until future access is needed, and many others kept at the lowest possible maintenance levels.

Ability of the Road System to meet Objectives

The Siuslaw National Forest envisions a less extensive road system. This system will allow travel across the Forest and provide reasonable access to major points of interest and resource management areas. To achieve such a system and meet management objectives, the Forest identified a 'primary' and 'secondary' road network (together called the **Key Forest Routes** [or **Key Forest Roads**]).

The **primary** system of roads will handle the majority of Forest visitor and other travel needs. These roads are identified on the Forest Visitors' Map as the best travel routes. Clear directional and informational signing along roads will also identify them. Roadside recreation, trailheads and viewpoints will be featured along these roads.

Secondary roads complete a network of vital connections. They lead recreationists, resource managers, permittees, land owners, and emergency services along direct routes into and across all areas of the Forest by connecting with short roads to trailheads, project sites, special use areas, development sites, or private lands.

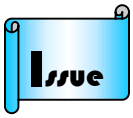
Two levels of roads, low clearance and high clearance, make up the secondary road system. Passenger cars will be able to easily travel over low clearance roads, whereas vehicles like pick-up trucks or sport utility vehicles will be recommended for high clearance roads, especially during rainy periods.

The process of selecting and managing the network of Key Forest Roads is designed to be fluid and adaptable over time. 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. If this is done then it is anticipated that the network of Key Forest Roads will evolve and approach the minimum Forest transportation system that best serves current and anticipated management.

Typical "High clearance" Key Forest road

ISSUES

Economic Issues



- **Road Maintenance funding is not adequate to maintain the current Forest Service road system to standard (i.e., all Forest roads).**

- **Future funding trends indicate that Road Maintenance funding will not be adequate to maintain the *Key Forest Routes* to standard. The Key Forest Routes/Roads** (identified as *primary* and *secondary* in the Siuslaw Access and Travel Management [ATM] Guide) **are believed to represent the minimum road system needed for public and administrative access.**

Current Situation

During the early 1990s, reductions in timber harvest and corresponding reductions in maintenance and repair budgets associated with timber sales highlighted the need to reduce overall miles of maintained roads. It was apparent from an economic standpoint that projected budgets for maintenance and needed repairs of the Forest road network would not meet the needs of the extensive road system. In addition, as management direction changed from an emphasis on timber commodity production to protection and restoration of wildlife and fish habitat, the Forest recognized that the existing road system would quickly become a liability to resources if not properly maintained.

Much of the Forest road budget came from congressionally allocated budgets but a large portion also came from cooperative deposits associated with timber sales. By the early 1990s the allocated and cooperative funds were reduced by about 75% of previous budget totals for road maintenance. 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 repair of the existing system. This trend of reduced timber funding opportunities and redirection of management priorities led to the initial strategy of Key Road selection implemented by the ATM guide in 1994. 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.

In recognition of the potential resource damage inherent in a poorly maintained road system given the high precipitation in Oregon's coastal mountains, roads not selected as part of the Key Road system were stabilized by constructing fairly deep diagonal water bars across the road surface, thus allowing water to drain off the roads when culverts eventually plugged due to lack of maintenance. In most cases those roads that were not regularly driven by high clearance vehicles became overgrown with brush and down trees in less than five years due to the rapid growth of vegetation and regular windstorms common in the Coast Range. It was expected the stabilized roads would be resistant to washouts and fill failures since the waterbars were designed to remove water from the road surface regardless of rainfall intensity.

This strategy was tested by the winter storms of 1996 and 1997 that caused extensive damage to the Key Road system with almost no effect on the waterbarred, stabilized roads. About half the damage to Key Roads resulted from overflowing culverts and flooded streams washing out road segments and damaging road surfaces; the other half from slumps and fill failures.

This is partly due to the difference between most Key Roads and those that sustained little damage. The majority of waterbarred and stabilized roads are fairly short dead-end spurs accessing timber harvest units and project sites while the Key Road system is mostly comprised of older roads that were in place prior to 1970. Many of the Key Roads are valley bottom and mid-slope roads with high numbers of stream crossings and culverts. Key Roads are also more costly to maintain since they are more difficult to stabilize, more prone to winter storm damage, and more traveled by both public and forest management traffic. The existing road system is a combination of Key Roads that receive prioritized maintenance and stabilized roads that are not regularly maintained.

Current budget allocations do not provide adequate funding to maintain even the Key Road network to established standards. The limited maintenance funds allocated to the Key Road system have been focused on ditch line and drainage clearing, brushing roadsides to maintain visibility, and road surface treatments. Additional maintenance of the Key Roads and maintenance of the non-Key Roads is deferred. More significant needed repairs of failing road surfaces, failing cut and fill slopes, major resurfacing, and signing have been deferred. Periodic surveys of the deferred maintenance needs reveal there are millions of dollars in repairs not being accomplished. The current situation is that of a Key Road system receiving reduced maintenance, a stabilized system of non-Key Roads, and a backlog of deferred maintenance on both Key and non-Key Roads. Although decommissioning and stabilizing non-Key Roads have reduced the overall miles of maintained system roads, current and expected budget allocations are still far below funds required to adequately maintain the existing road system.

Table 2. Road maintenance cost comparison.

ROAD SYSTEM	MILES	ANNUAL MAINTENANCE COST (FULL COST)[1]	DEFERRED MAINTENANCE COST[2]
Key Roads	770	$3,762,000	$17,917,000
Non Key Roads	1,510	$2,494,000 (Not currently maintained)	$6,917,000
Total	2,275	$6,256,000 (If all miles maintained to standard)	$24,824,000

[1] Full cost includes both custodial maintenance and periodic surfacing replacement. Does not include drainage structure replacements.

[2] Deterred Maintenance includes deficiencies identified by field surveys (1997-2002) in accordance with national road standards protocol (Stokes 2002).

Table 2 summarizes the cost to maintain the current road system to standards, and the deferred maintenance costs for repairs. 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 through 2002.

The 2002 budget allocation for road maintenance is $767,000 dollars or about 22% of the needs for the Key Road system. There are no regular budget allocations for deferred maintenance at this time.

Risks and Benefits

Potential risks associated with reduced or limited road maintenance are decreased user safety and increased resource damage. Smaller routine maintenance budgets result in less road brushing, surface maintenance and signing, which decrease visibility, driving comfort and directional information. Less ditch line and culvert cleaning increases the likelihood of water damage to road surfaces and increased sedimentation into aquatic systems. Deferred maintenance on road segments that have deteriorated over time contributes to unsafe use of the roads and potential for catastrophic damage resulting from storm events.

"Low clearance" Key Forest Road

The benefit 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 project needs exceed funding sources.

Desired Future Condition

A minimum Forest transportation system that safely and efficiently serves current and anticipated management objectives and public uses. A balance of routine and deferred maintenance funding maintains this system, which meets public uses and resource protection objectives.

Available funding is primarily allocated to the Key Road system. Roads not a part of the Key Road system are maintained by project-associated funds commensurate with project use.

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.
- Inventory annual and deferred maintenance needs of the Key Forest Road system. Prioritize road maintenance work to ensure resource protection and user safety within current and anticipated Forest budgets.
- Consider alternative funding sources for road maintenance and repair. Examples include:
  - ⇨ Internal funding programs to supplement maintenance budgets in order to meet minimum maintenance standards.
  - ⇨ Cooperative agency funding and grants for improvements to the Key Road system resulting in improvements to fish and aquatic habitat.
  - ⇨ Partnerships with other road management agencies, local communities and user groups.
  - ⇨ 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.

Access and Community Impact Issues

- **The current Forest road system provides access to public lands but funding has not kept pace with maintenance needs.**

- **Local communities and businesses may depend on Forest roads as alternate access routes between rural communities and emergency evacuation routes.**

- **People and communities who depend on Forest roads will be affected as access to many areas of the Forest becomes limited. Creative ways to reduce costs and maintain roads should be developed.**

Current Situation

Community impacts in relation to declining maintenance funding and reduced open road access were addressed in the Siuslaw National Forest Access and Travel Management analysis in 1994 (see Appendix B, page 59). The analysis developed a process for identifying a network of **Key Forest Roads** as a means of reducing costs and applying limited funds to roads most vital to communities and long-term management of the Forest.

The question to be answered in relation to the issue of community impact is:

> ***Can the process for identifying, maintaining, and managing the network of Key Forest Roads in the 1994 Access and Travel Management Guide be brought forward as a key result of the 2003 Roads Analysis?***

The 1994 Access and Travel Management analysis included extensive public involvement that resulted in contacts with the general public and local communities, as well as state, county, and local road agencies. The information, concerns, and access needs collected from this effort were analyzed and are incorporated into the process of selecting and managing the network of Key Forest Roads. This process is based on categorizing each national forest system road into one of three categories:

"High clearance" Key Forest Road

Primary Road

Primary roads are to be kept open and are first priority for maintenance funding. These roads are typically maintained to safely accommodate passenger cars.

Secondary Road

Secondary roads make a direct single connection to management areas outside the reach of primary routes. These roads are typically managed at a lower maintenance standard than a primary road.

Roads other than Primary or Secondary

These roads will be considered for lower maintenance standards, restricted access, closure, or decommissioning during watershed or project level analysis.

The Access and Travel Management analysis recognized that people and local communities depend on some Forest roads more than others. The primary and secondary selection criteria were developed as a means to identify and prioritize maintenance for roads vital to local communities. These are the priority roads that connect public roads, provide access to communities, connect land in other ownerships, and are first to receive funding to address the safety of road users.

The 1994 Access and Travel Management analysis resulted in the following criteria for the selection of the network of Key Forest Roads:

Primary Route Selection Criteria:

- ❶ Roads that link state and county roads, which connect high-use entry points or population centers and provide major access into and through the Forest.
- ❶ Among primary road alternatives, select the one that favors the greatest use of state and county road systems (these are usually double-lane roads and highways).
- ❶ Roads that help provide the most extensive linkage to secondary networks.
- ❶ Roads that are designated scenic routes or auto tours.
- ❶ Roads that provide access to recreation areas, which contain a number of developed sites and facilities

Secondary Selection Criteria:

- ❷ Roads that give the best access to management areas outside the proximity of the primary network, considering that these areas or project sites cannot be accessed by short-term, temporary roads, or by means other than highway vehicles.
- ❷ Routes that extend primary Forest roads as well as state and county roads, and give needed long-term access.
- ❷ Long-term roads with only periodic or seasonal restrictions.
- ❷ Roads that access developed sites, wilderness trailheads, multiple resource management areas, and special sites and facilities that require permanent vehicle access.
- ❷ A single road selection from alternative routes to the same area, site or destination that will generate the least amount of negative resource impacts (*e.g.,* selecting a ridge-top road over one within a riparian zone that meets the same destination access needs).
- ❷ Long-term roads that are supported by cooperative share-cost agreements or other partnerships and open to public travel.

The process outlined in the 1994 ATM Guide was evaluated based on Road Analysis Questions GT(1-4) page 50 and SI(6), page 55 to determine whether it is still valid based on these questions.

Conclusion:

It was found that the ATM process, as described and updated in this document, is functioning well.

Risks and Benefits

As maintenance budgets continue to decrease, there is a risk that road safety deficiencies will increase over time. As these roads deteriorate over time, local communities and businesses that depend on these roads for access or as emergency evacuation routes may suffer.

Medical response time is also greatly increased in areas with limited access. Should a medical emergency occur, treatment and evacuation of people using the Forest (*e.g.,* by hiking, hunting, fishing, gathering of forest products) would decrease in efficiency with a decrease in road density.

The benefit of identifying and managing the network of Key Forest Roads is that it prioritizes funding to those roads most important to the local communities. The maps of Key Forest Roads (Appendix C) display the priority road network in a way that is easily understood by the public as well as forest management specialists.

Desired Future Condition

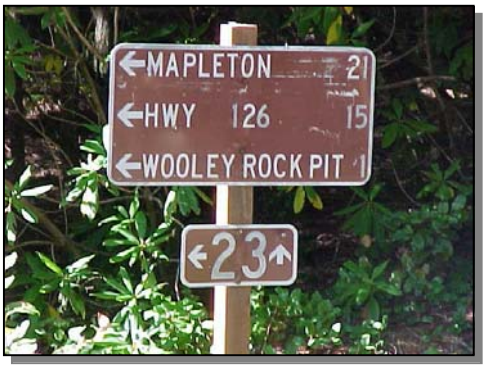
The Forest transportation system provides key access routes through the Siuslaw National Forest within current budget allocations. Responsible officials coordinate with other public agencies and private stakeholders to identify and integrate current access needs and balance these with transportation system costs.

Recommendations

- Use the Key Road system as the basis for making site-specific road management decisions. If needed, adjust the system to meet changing needs and conditions over time.
- Maintain access to private lands.
- Maintain linkages between State Highway 101 and the county road system, as well as the east-west flow of local community and emergency traffic over the Oregon Coast Range.

  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 clearing brush along hazardous routes, spot rocking damaged road surfaces, or by signing critical junctions until full maintenance can be accomplished.
- 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, adjustments or modifications to the Key Road system can be addressed at the watershed/project scale analysis.



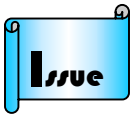
Typical directional signing on Key Forest Roads

Environmental Issues

The Forest Road system affects the basic resources of soil, water, fish, wildlife, and vegetation. Access to prime habitat areas can increase the vulnerability of animals and cause a re-distribution into less desirable areas. These same travel ways also provide access for recreation and resource management projects. Human access into remote areas can disturb wildlife and sensitive plants. While these effects are addressed in general terms in this analysis, they are considered in more detail at the watershed/project level.

Aquatics and Water Quality

Roads can affect streams in a variety of ways. The potential for landslides can be increased, both fine and coarse sediment input may be increased, subsurface flow can be intercepted and rerouted through ditches and culverts, low-gradient streams may be constricted in valley bottoms by the presence of roads, the movement of large woody debris from upper hillslopes to valley bottoms can be interrupted by mid-slope roads, and riparian vegetation can be affected.



◈ Roads can increase the potential for landslides.

Current Situation

In the Oregon Coast Range, road-related landslides are usually debris flows, which flow down high gradient stream channels. Depending on the volume of the material, the valley configuration, and the angle of stream confluences, these debris flows can travel long distances, and may reach perennial, low gradient streams. Debris flows occur naturally but the presence of roads can increase the potential for occurrence in moderate size storms.

On the Siuslaw National Forest, risk factors for road related landslides include mid-slope roads, roads built using side-cast techniques where unstable fill can become saturated and fail, and undersized culverts that can become plugged and cause water to be diverted out of a stream channel.

Until the early 1970s, Forest roads were commonly built using side-cast techniques, where excavated material was simply pushed over the side of the road to create the shoulder. As a result, the roads with the higher risk of landslides tend to be the older roads, which are often in the Key Forest Road system. These older roads also tend to have undersized culverts that are more likely to plug with debris.

Beginning in the early 1990s, all roads on the Siuslaw National Forest were inventoried and surveyed for problem areas, and culvert locations. In addition, all culverts were inventoried, and problems and diversion potential were documented in 1995. This information is available on the GIS system. More information and recommendations were provided by watershed analyses.

Risks and Benefits

Mid-slope roads crossing streams on steep ground that receive little or no maintenance are at the highest risk of debris flows. Debris flows originating at roads tend to have very little large woody debris input into streams. While they can add gravels to low-gradient streams, which could be considered a benefit in gravel-deficient streams, the debris flow input can have short-term detrimental effects, such as aggrading the stream bed, filling in pools and covering existing spawning gravels with fine sediment.

Many of the roads at high risk for landslides have already been closed or decommissioned on the Siuslaw National Forest; however, some roads, especially those that will remain open, continue to be at risk.

Stabilized mid-slope road

Desired Future Condition

Mid-slope roads located on steep slopes with multiple stream crossings are either:

1) Closed, with the stream crossing culverts and fills removed and the road bed and fills stabilized; or
2) Stabilized with upgraded culverts.

Recommendations

- Follow recommendations of watershed analyses and the Forest Restoration Plan (USDA 2002).
- Identify the roads that are still at a high risk of landslides. If they are part of the Key Road system stabilize them; if they are not, consider them for closure or decommissioning.

  Tools useful in this analysis are:

  - ⇨ Watershed analyses.
  - ⇨ Slope stability maps that identify steep, concave slopes. These maps were generated for specific watershed analyses.
  - ⇨ The debris flow models created by the CLAMS project. These maps show areas where debris flows are likely to originate, and how far the debris flow will travel.
  - ⇨ The Forest culvert inventory that shows the location and diameter of culverts.
- During project planning, identify roads that will not be needed and close or decommission them.

◈ There is a potential for increased input of fine and coarse sediment into streams from roads.

Issue

Current Situation

In the Oregon Coast Range, the dense vegetation cover and high infiltration rate of soils results in low to non-existent surface erosion in natural areas. Surface erosion from roads can occur where steep, unvegetated cut slopes are present, in ditch lines (especially those with a moderate to steep gradient), and from roads with no gravel or asphalt.

Depending on the type of bedrock, some areas of the Coast Range have a higher potential for erosion and generation of fine sediment. Generally, areas underlain by basalt generate less fine sediment while areas underlain by fine siltstones (such as areas around Hebo) generate more.

Sediment generated from roads may or may not reach stream channels. Sediment diverted off the road and out of ditches by water bars is usually deposited on the slope below the road and does not reach stream channels. Sediment that travels down ditches may reach live stream

crossings where it enters the stream system or is carried through a cross-draining culvert and deposited on the hill slope below the road.

Risks and Benefits

Increased fine sedimentation can cover spawning beds. Although many of the roads on the Siuslaw National Forest have been waterbarred, and most have a rocked surface (which reduces the fine sediment production), some roads still have the potential to produce fine sediments.

Desired Future Condition

Roads with a high potential to produce fine sediment have been treated to reduce fine sediment deposition into streams.

Recommendations

Stabilized, non-Key Forest Road

- Follow recommendations of watershed analyses and the Forest Restoration Plan (USDA 2002).
- Leave ditches vegetated as often as possible. Vegetation acts as a filter and reduces the amount of fine sediment that reaches stream crossings.
- Provide an adequate covering of rock on roads that will remain open.
- Restrict timber haul to the dry season on roads prone to sedimentation. If timber haul must take place during the wet season, monitor rainfall, and reduce or eliminate timber haul during rain events. (See Siuslaw Road Rules, USDA 1998b.)
- Install and maintain surface crossdrains (*e.g.,* waterbars, grade dips, outslope drains, *etc.*) on roads not designated for passenger cars.

Issue

◈ **Roads can intercept and re-route subsurface flow resulting in increases in peak flows, and in changes in the timing of storm runoff to streams.**

Current Situation

Mid-slope and valley bottom roads can intercept subsurface flow. On the Siuslaw National Forest, most valley bottom roads are either county roads or private roads. Many of the mid-slope roads have been decommissioned. Those that remain can still intercept the subsurface flow from cut banks and re-route it through ditches into cross-drains and stream crossings. During storms, ditch lines act as an artificial extension of the stream network, thereby increasing peak flows.

Risks and Benefits

Increased peak flows can alter stream morphology. Stream channels are formed by the "bankfull" flow, which is defined as the flow that fills the channel to the top of the banks, and is thought to have an average recurrence interval of 1.5-2 years. Increasing the flow may cause the channel dimensions to change, *i.e.,* get deeper and/or wider to accommodate the higher flows. In the Coast Range, this change will be hard to document because stream flows tend to

be "flashy," *i.e.,* they rise and fall quickly with rainfall events, and flows tend to be highly variable. For instance, North Creek, a tributary to Drift Creek of the Siletz River has low summer flows of 6.5 cubic feet per second (cfs), and a two-year flow of 390 cfs.

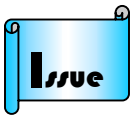
Desired Future Condition

Mid-slope roads are closed or stabilized. The fills and culverts of closed roads have been removed to prevent landslides and stream diversions, and the road surface waterbarred to allow water intercepted by cut banks to flow across the road and into the slope below the road.

Recommendations

- Follow recommendations of watershed analyses and the Forest Restoration Plan (USDA 2002).
- Close and decommission unneeded mid-slope roads.
- Install and maintain surface crossdrains (*e.g.,* waterbars, grade dips, outslope drains, *etc*.) on secondary high clearance roads to allow water from the ditch line to travel across the road surface to the slope below. This would dissipate water intercepted by cutbanks and prevent it from being delivered directly to stream channels.
- Disconnect road system from stream channels by waterbarring roads wherever possible. This would deliver water as naturally as possible to the slope below the road rather than concentrating runoff along ditch lines to the nearest stream, thereby extending the stream network artificially.

◈ **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. This situation can lead to placing riprap on the side of the road or on the stream bank to prevent the stream from undercutting the road. Stream velocities tend to be higher near banks with riprap than those with vegetation, since riprap is a hard surface that doesn't absorb the stream's energy in the same way as vegetation. As a result, bank erosion downstream from riprap can increase. Riprap also doesn't provide habitat for fish and riparian species.

On the Siuslaw National Forest, most valley bottom roads are either private or county roads because of the history of homesteading in the valley bottoms. Therefore, decommissioning or re-routing these roads will take cooperation between the Forest Service, other agencies and governments, such as counties, and other landowners.

Risks and Benefits

Roads that impinge on low gradient stream channels impede channel migration and the processes of erosion and deposition, and habitat creation associated with migrating channels. Also, the roadbed is at risk of erosion, which usually requires bank stabilization measures, such as riprap.

Desired Future Condition

Roads do not impede stream channel movement.

Recommendations

- Follow recommendations of watershed analyses and the Forest Restoration Plan (USDA 2002).
- Forest roads adjacent to low-gradient streams and floodplains should be relocated or decommissioned. Work with the county governments and willing landowners to relocate easements or rights-of-way.

Issue

◈ **Mid-slope roads can interrupt the movement of large woody debris from upper hillslopes to valley bottoms.**

Current Situation

In the Oregon Coast Range, much of the large woody debris in low gradient streams is deposited by debris flows from high-gradient tributaries. Over time, these woody debris deposits create complex aquatic habitat. Mid-slope roads that cross high-gradient tributaries can act as barriers between the source areas of debris flows and woody debris and the low gradient streams. Wood and sediment can become trapped behind stream crossings, reducing downstream delivery and increasing the risk of road failures.

Risks and Benefits

With existing mid-slope roads located on steep ground that have not had stream crossing fills and culverts removed, the possibility of debris flows occurring upslope and depositing wood and sediment at the road crossing still exists. Potential detrimental effects include: reducing the amount of wood that would otherwise reach the stream channel down slope, plugging the culvert at the road-stream crossing and diverting the stream channel's flow down the ditch, and/or road failure, resulting in a larger debris flow continuing down the channel.

Stabilized mid-slope road

Desired Future Condition

Few, if any, unstabilized mid-slope roads remain open. The fills and culverts of closed roads have been removed at stream crossings. If debris flows did occur upslope of a road location, the debris flow could continue downstream without incorporating the road fill.

Recommendations

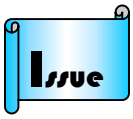
- Follow recommendations of watershed analyses and the Forest Restoration Plan (USDA 2002).
- Identify mid-slope roads located on high-risk land for debris flows. If they are part of the Key Road system stabilize them; if they are not, consider them for closure or decommissioning. Seek alternative routes for Key Roads that cross unstable areas.
- During project planning, identify roads that will not be needed and close or decommission them.

Fisheries

The declining status of anadromous fish on the Siuslaw National Forest is of concern. Species at highest risk are those currently listed as threatened under the Endangered Species Act: the Oregon Coast coho salmon, Upper Willamette spring chinook salmon, and Upper Willamette winter steelhead. Also of special interest and considered sensitive by the Forest Service are coastal cutthroat trout, winter steelhead, spring chinook, and chum salmon. Other fish species include sculpins, dace, lamprey, mountain whitefish, suckers, northern pikeminnow, estuarine species like surfperch and starry flounder, and warm water fishes introduced primarily into lakes at the Oregon Dunes NRA. The Forest has about 1,200 miles of anadromous fish streams (all free-flowing), more than any other Forest in the contiguous U.S. It is also adjacent to the Pacific Ocean and includes a number of estuaries.

Roads influence the health and distribution of stream-dwelling species in several ways. When roads encroach directly on stream channels and adjacent riparian areas, natural stream processes are modified. Wood and sediment can be trapped behind stream crossings, reducing downstream transport and increasing risk of crossing failure. Road alignment and road fills can isolate floodplains, constrict the channel, constrain channel migration, and simplify riparian and aquatic habitat. Also, in some places, road encroachment can divert stream flows to the opposite bank, thereby destabilizing the hillslope and resulting in increased landslides. Construction and use of roads can lead to unwanted sediment and human activities, while culverts may often limit passage of aquatic organisms under roads.

- **Impacts of roads on riparian areas and fish habitat and populations include loss of streamside vegetation and shade; compaction or loss of floodplains; destabilization of steep slopes adjacent to streams; fishing; poaching; vandalism; and litter.**



Current Situation

Roads located in riparian areas have led to loss of shade and floodplain habitat, constriction of channel reaches, and provided easy access for removal of large instream or near-stream wood until policies changed in response to a wider range of ecosystem values in the 1990s. These types of impacts are fairly common on the Siuslaw NF outside of congressionally designated wilderness areas. Many of these situations were identified in watershed analyses over the last decade. As follow-up to watershed analyses many of these site-specific impacts have been or are currently being addressed. Some key stream reaches occupied by steelhead, chinook, and threatened coho salmon do not have roads in riparian habitat and serve as refugia that are likely to remain protected in the future.

Since most of the main rivers and many of the larger fish-bearing tributaries outside of congressionally designated wilderness areas 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.

As of 2002, the Siuslaw NF has not had a significant issue of accidental or intentional releases of non-native aquatic organisms (with the exception of warm water fishes which, for the most part, were introduced many years ago in lakes at the Oregon Dunes NRA). However, in those same lakes, non-native aquatic plants are of concern. Many of these introductions are tied to the road system. The road system does allow the State of Oregon to stock fish for recreational fishing. They use a combination of native and non-native salmonids, and have used fewer non-native stocks as ecological concerns about native aquatic species have increased.

A legacy of timber management prior to 1990 has left the landscape with many riparian roads and significant riparian areas that were clearcut to the stream bank. Many of the impacts were analyzed during watershed analysis. Stream temperature increases could only be explained by timber harvest, which involved riparian harvest and sometimes building of roads and even landings in riparian areas. This in turn has reduced the ability of streams to support native salmonids due to loss of habitat complexity. In some cases, where warmer temperatures occur, we have observed upstream movement of fish species associated with warmer stream temperatures (*e.g.,* redside shiners, pikeminnows, suckers).

Risks and Benefits

When roads are constructed adjacent to streams, riparian vegetation is often removed to accommodate the road right-of-way, improve visibility, and reduce any hazard of trees falling on the roadway. This action can reduce shading of the stream, however, causing increased stream temperatures, reduced potential for recruiting large woody debris in the stream, reduced leaf fall and riparian invertebrates, and loss of habitat for aquatic and riparian species. Another risk is from transport of chemicals or contaminants that could seriously damage aquatic life if (when) a truck accident occurs.

Not all areas have the same biological values. The first step of any recovery plan is to secure the best habitats and populations as much as possible. It is recommended that restoration efforts begin in refugia that have particularly good fish habitat and/or populations in order to protect these special resources (*e.g.,* through storm proofing of roads). The degree of acceptable risk of activities in such areas is lower and restoration priority is higher because these refugia are so critically needed for the recovery of fish runs. Determining the spatial coincidence of roads with such areas is a first step in determining if roads are affecting them. Roads in such areas may be a high priority for detailed examination and analysis to determine the extent of actual effects.

The road system facilitates access to streams, lakes and wetlands where at-risk species may live. Recreational use of aquatic resources, if improperly managed, can contribute significantly to declines in rare or unique native invertebrate populations or damage to important aquatic habitats.

Due to the significant road infrastructure on the Siuslaw National Forest, we know that the road system has altered the capacity of stream channels for large woody material. This is primarily due to undersized culverts easily plugged by woody material, or culverts failing due to age. It is less clear how much smaller sediment and organic matter is prevented from moving downstream due to culverts. The road system allowed removal of in-stream and near-stream large woody material prior to 1990, which has apparently **increased** stream energy and the resultant movement of sediment and organic matter downstream (as opposed to the issue about **prevention** of downstream movement). Effects of this reduction of hydraulic complexity should be studied in greater detail.

Stabilized, non-Key Forest Road

Desired Future Condition

The Forest's Ecosystem Restoration Strategy (USDA 2002) calls for "a stable adequately drained road system that provides access and allows for natural stream processes and passage of aquatic species." In particular, stream channels would be dynamic. They would migrate within historic flood plains, eroding the bed and banks in one place while aggregating the bed and building new banks in other places. Streams would also transport and deposit large pieces of woody debris and fine organic matter, providing physical structure and

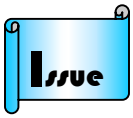
diverse aquatic habitat to the channel. Vegetation near streams would deposit nutrient inputs (*e.g.,* insects, leaves) and large woody material in the channels, while resultant shade would keep water temperatures relatively cool. A filter of plant material would prevent most sediment from entering stream courses; floodplains would be pervious and freely connected to channels; steep slopes adjacent to streams would be relatively stable; and evidence of behaviors such as poaching, vandalism, littering, and removal/trampling of riparian vegetation would be rare.

Recommendations

- Follow recommendations of watershed analyses and the Forest Restoration Plan (USDA 2002).
- During project planning, explore all reasonable options for reducing or eliminating impacts to coho salmon.

  This is in line with the National Marine Fisheries Service's request to eliminate or mitigate roads that pose risks to coho salmon recovery. It is recognized that this may not be feasible in cases where the road is an established travel route, and there are limited possibilities for relocating the road.
- Explore opportunities to reduce disturbance of coho salmon resulting from access to and use of dispersed areas.
- Explore options for learning about the effects of simplification of channel conditions at road crossings (*e.g.,* removal of roughness elements like large woody debris) on streamflows and fish habitat.

◈ Road construction, maintenance, and use may lead to excessive fine sediment entering stream channels.



Current Situation

Surface erosion occurs on most wildland roads because their surfaces, cutslopes, fillslopes and associated drainage structures are usually composed of erodible material and are exposed to rainfall and concentrated surface runoff. Surface erosion and associated sedimentation are highly sensitive to road maintenance practices, and small changes in road drainage configuration can markedly increase erosion and routing of eroded sediments.

In the Coast Range major channel changes, including noticeable aggradation, often occur during high flow events. The road system, as well as past timber units, was documented as contributing to stream aggradation at specific sites on the Forest after the floods of 1996, particularly in watersheds with high numbers of stream/road crossings.

Stabilized, non-Key Forest Road with vegetation encroachment

Risks and Benefits

Heavy use of roads during wet weather conditions, particularly from trucks hauling logs or gravel, can damage road surfaces and increase runoff of sediment into nearby streams. This occurs through rutting and resultant transfer of fine sediments from within the gravel to the surface of the road.

Culverts at road-stream crossings can cause

large inputs of sediment to streams when hydraulic capacity is exceeded, or the culvert inlet is plugged and streamflow overtops the road fill. The result is often erosion of the crossing fill, diversion of streamflow onto the road surface or inboard ditch, or both.

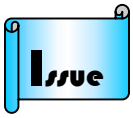
On soils with moderate or high potentials for fine sediment, unstable soils, or steep slopes, roads may lead to excessive fine sediment entering stream channels. These "fines" are likely to settle in relatively low gradient, depositional sections of stream channels often favored as spawning sites by salmonid species. Fine sediments interfere with reproductive success by interrupting the ability of eggs to metabolize and/or smothering young fish that have not emerged from the interstitial spaces of spawning gravel areas.

Desired Future Condition

The Forest's Ecosystem Restoration Strategy (USDA 2002) envisions "a stable adequately drained road system that provides access and allows for natural stream processes and passage of aquatic species." In particular, any amounts of sediment from roads and road-related activities are small, and a filter of plant material prevents most of it from entering stream courses.

Recommendations

- Follow recommendations of watershed analyses and the Forest Restoration Plan (USDA 2002).
- Identify roads chronically increasing fine sediment in aquatic habitat and take corrective action (*e.g.,* closure, decommissioning, upgrading).
- Identify roads that pose a high risk of landslides (a source of fine sediments) and take corrective action (*e.g.,* closure, decommissioning, upgrading).
- Create an inventory of all road-stream crossings (i.e., culverts) on the Forest. Prioritize repair and upgrade of culverts based on severity of risk of failure and cost.
- Identify areas with a high risk of fine sediment deposition (i.e., landslides), which would impact fish-bearing streams and prioritize for corrective action.
- Explore opportunities to learn more about the impact of fine sediment on aquatic species habitat and survival. Use floods as an opportunity to learn more about stream dynamics.



◈ Risk of impacts by roads on stream channels and aquatic species depends on location, road age, type of surface material, and number of stream crossings.

Current Situation

The degree of surface erosion from any particular road segment on the Siuslaw National Forest differs greatly depending primarily on the erodibility of the exposed surface; the slope of the exposed surface; and the area of the exposed surface that generates and concentrates runoff.

Risks and Benefits

The age of a road, surface material, number of stream crossings and drainage features, density of roads, and the percentage of a watershed that has been harvested (*e.g.,* hydrologically unrecovered) are all factors that can increase the risk of roads impacting beneficial uses such as fish reproduction, distribution, and survival. Impacts can occur chronically (*e.g.,* sedimentation from road and roadside run-off, fish distribution restrictions and alterations in stream channel

morphology due to improperly sized or placed culverts) or as a result of significant episodic events, such as floods or catastrophic fires, that may lead to increased runoff and therefore impact water quantity and quality.

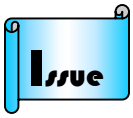
Desired Future Condition

The Forest's Ecosystem Restoration Strategy (USDA 2002) envisions "a stable adequately drained road system that provides access and allows for natural stream processes and passage of aquatic species." In particular, roads that pose high risks of damage to aquatic habitats would be in a treated or decommissioned state that minimizes those risks.

Recommendations

- Follow recommendations of watershed analyses and the Forest Restoration Plan (USDA 2002)
- Consider the following factors in determination of impacts on fish and other aquatic resources:
  - ⇨ Type, condition, and number of stream crossings at a road-segment scale.
  - ⇨ Road-segment interaction with a stream's floodplain, where the road is parallel to the stream.
  - ⇨ Road surface type.
  - ⇨ Culvert fill-failure risk.
  - ⇨ Sustained steep (>15%) road grades in excess of 500 feet).
  - ⇨ Percent of road with sideslopes >51%.
  - ⇨ Road maintenance records. At a minimum, a record of maintenance accomplished (date, type), including knowledge of site-specific chronic or severe maintenance sites should be documented.
  - ⇨ Documentation of known spawning reaches with review by state and other agency biologists.
  - ⇨ Track temporary road locations, construction, and decommissioning or obliteration. This information is required in ESA consultation, but is not currently tracked in the Forest road database, which tracks system roads. Responsibility for tracking these roads may not rest with the Forest Engineering Department.
- 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.

◈ Culverts of inadequate size or performance restrict passage of fish and other aquatic organisms.



Current Situation

Using a consistent Regional protocol, inventories completed in recent years suggest that most culverts at road-stream crossings on the Siuslaw National Forest block or impede migration of some life phases of various species of fish and other organisms. Although many resident aquatic species travel significant distances along streams throughout their life, both diurnally and seasonally, this situation probably has the most serious (though largely undocumented) consequences on anadromous salmonids (salmon, steelhead, and searun cutthroat trout) and lampreys.

Risks and Benefits

Most culvert blockages prevent or restrict upstream migration, though sometimes downstream migration through a culvert can also pose hazards to the fish from poor outlet conditions (e.g., high perch with no outlet pool). Blockages at the crossing may be partial or total, and they can affect adult spawners, migrating juvenile fish, or both.

Removal of such artificial barriers will provide each fish species with the greatest opportunity to capitalize on available productive habitat, and recovery of species like the coho salmon is dependent upon the ability of all life stages to move to suitable habitat.

In rare cases, maintaining barriers at road crossings is desirable where such barriers prevent invasions by unwanted aquatic species.

Desired Future Condition

The Forest's Ecosystem Restoration Strategy (USDA) envisions "a stable adequately drained road system that provides access and allows for natural stream processes and passage of aquatic species." In particular, nearly natural stream conditions (gradients, flows, substrate) extend through road crossings.

Recommendations

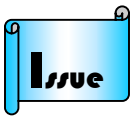
- Follow recommendations of watershed analyses and the Forest Restoration Plan (USDA 2002).
- Utilize the stream crossing inventory to identify all road-stream crossings (*i.e.*, culverts) on the Forest. Prioritize repair and upgrade of culverts based on risk of failure and impact to fish passage and other aquatic resources.
- Where fish passage is affected, use an interdisciplinary process in the design of culverts (*e.g.,* fisheries biology, engineering, geomorphology, hydraulics, hydrology).

Two views of the same culvert. Notice the culvert is large enough to accommodate high water flows. The rocks on the bottom recreate natural stream flows, which allow passage of aquatic organisms through the pipe.

Terrestrial Wildlife

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:

- **Edge effects and fragmentation;**
- **Barriers to species movement; and**
- **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 (Murcia 1995). 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 (Murcia 1995).

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 Siuslaw National Forest. The Assessment Report of Federal Lands in and Adjacent to the Oregon Coast Province (USDA 1995a) documents changes in the size and composition of patterns as a result of road construction and harvest activities. The report concluded that the large (1001-10,000 acres) and jumbo (>10,000 acres) scale disturbance regimes, which previously dominated the landscape, have been replaced by small (<100 acres) and medium (100-1000 acres) scale disturbance regimes. It also documents the associated loss of large blocks of isolated forest habitat favored by species such as fisher and wolverines. During the 1980s and into the early 1990s the continued decline in mature forest habitat led to listing of Northern spotted owls and marbled murrelets as threatened under the Endangered Species Act (ESA).

A second major impact of roads on wildlife is a **barrier to species movement**. The barrier effect is sensitive to both road width and traffic density (Forman and Hersperger 1996). As road width and traffic density increase, roads become more effective barriers to movement (Reudiger 1996). Roads create additional barriers to movement where the road shoulders and cutbanks create an over-steepened slope, and where undersized culverts bisect channels. When populations become subdivided, there is increased risk of demographic fluctuation, local extinction of subpopulations, less re-colonization after local extinction, and a progressive loss of local biodiversity (Soule 1987).

Finally, the extensive network of Forest Service roads also creates opportunities for **human activities** to impact terrestrial wildlife. In past decades, the Siuslaw 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 marbled murrelets, and Northern spotted owls. Through agreements with ODF&W (Oregon Department of Fish & Wildlife), some roads have been closed to reduce the impact of vehicles on elk feeding and calving areas.

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 are limited to the Key Road system, or project 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. Disturbances will continue to occur as All Terrain Vehicles (ATVs) pass closure devices in an attempt to access closed areas.

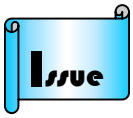
Desired Future Condition

The Key Forest Road system is limited to those roads required to connect major areas of the Forest and adjacent communities. Roads closed or decommissioned are free of barriers during periods they are not used for major forest management activities. Roads closed or decommissioned are not a source of disturbance during critical breeding, or rearing periods.

Recommendations

- Close or restrict access to roads used intermittently for forest management activities.
- Decommission unneeded roads.
- Limit roadside salvage sales to the Key Forest Roads.
- Minimize the effect of noise from road maintenance, reconstruction or decommissioning by managing the seasonal and hourly operating periods of projects.
- Reduce the operation of ATVs (All Terrain Vehicles) and other vehicles on closed or decommissioned roads by using road closure devices and administrative regulations.

Vegetation Management



◈ Maintain access to current or planned vegetation management projects.

Current Situation

The Siuslaw National Forest is virtually all in a Late Successional Reserve (LSR) or Riparian Reserve (RR) Land Use Allocation under the Northwest Forest Plan. Matrix lands receive the same treatment as LSRs and RRs due to their small size (under 10 acres) and scattered distribution on the landscape.

Natural stands on the Forest are primarily composed of 100 to 150 year old Douglas-fir stands and scattered, relatively small patches of remnant old growth. These stands originated following the last large fire in the coast range, the Yaquina Fire in 1850. Thus, most of the current natural

stands are in a mid seral stage. It's estimated that less then 10,000 acres of late successional forest survived this fire and subsequent harvesting.

Harvesting during the past 50-60 years has resulted in a highly dissected landscape. About 40% of the Forest is comprised of dense, uniform Douglas-fir plantations (10 to 100ac), resulting from intensive reforestation after harvest.

The Northwest Forest Plan indicates that active management of these plantations is important to restoring late successional forest conditions throughout the LSRs. Silvicultural activities promote diverse stand structure by manipulating stand density and establishing shade-tolerant species in the understory.

Most remaining natural stands exceed 80 years of age, beyond which stands are not treated under the Northwest Forest Plan. Therefore, access to these older stands is not an issue.

Stabilized, closed road.

The type of road access and maintenance level is a major factor in determining the type and intensity of stand treatment. For example, where roads are absent or decommissioned the cost to harvest and treat stands is increased. Additionally, these stands require longer duration and higher intensity silvicultural treatment. Stands adjacent to Key Forest Roads, however, are managed assuming access to the stand will be available in the future, allowing frequent, low intensity silvicultural treatment.

The Forest Restoration Plan (USDA 2002) prioritizes watershed restoration activities, including silvicultural treatments, to concentrate management activities over a short timeframe followed by a period of minimal management. During the latter, roads can be closed for a period of time (one year or longer) and later re-opened for silvicultural treatment.

Risks and Benefits

The current road system provides access to most of the stands requiring silvicultural management on the Forest. However, as more roads are closed or decommissioned, silvicultural activities may be limited or precluded due to higher unit costs.

Desired Future Condition

A limited Forest road system maintains access to stands less than 80 years old in order to allow silvicultural treatments to develop late successional conditions. Once this condition has been achieved, access to stands is no longer needed and non-Key Forest Roads are decommissioned.

Recommendations

- Identify and maintain key access points to accommodate equipment needed for thinning stands.
- Focus treatment on stands accessible from the Key Road system and other hydrologically stable roads (*e.g.,* ridgetop roads). Roads that will be decommissioned may be used for silvicultural treatment prior to decommissioning.
- When closed roads are reopened, use minimal impact techniques. For example:
  - ⇨ Keep clearing width to a minimum.
  - ⇨ Avoid sidecasting clearing debris and rootwads.

- Provide temporary drainage such as waterbars for wet areas (*e.g.,* seeps, springs). Reestablish natural drainage prior to road closure.
- Match road design with season of operation (*i.e.,* rock to support winter haul; rock north slopes when hauling during rainy season).

Issue

◈ Roads and associated human activities increase the spread of noxious weeds.

Current Situation

Roadside areas throughout the nation frequently support an abundance of non-native invasive plants (weeds). Weed abundance in these areas is often attributed to three factors:

1) 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;
2) 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
3) Vehicles traveling the roads and other human activities along road corridors often transport weed seed or propagules into the area (Baker 1986).

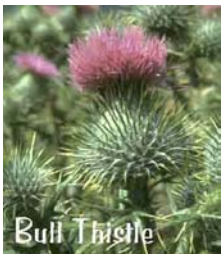
Roadside areas of the Siuslaw National system roads currently support substantial populations of non-native invasive plants. Weed surveys conducted during the summer of 2002 as part of an ongoing weed inventory project found that as much as 95 percent of the roadsides surveyed supported some level of weed infestation (Segotta, personal communication).

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. Weed species found along forest roadsides generally fall within three risk categories.

Category I (Low Risk) – Common weed species with short-term occupancy (or frequent disturbance)

These species are found along most roadsides on the Forest and are generally dependent on frequent disturbance, such as road maintenance, for long-term site occupancy. Dispersal mechanisms and vectors for seed transport of many of these species is wind. However, road traffic, maintenance machinery and other human uses contribute to seed transport and spread. Some species in this category are listed on the Oregon Department of Agriculture's Noxious Weed List. Examples of plants in this category include tansy ragwort, bull thistle and Australian fireweed.



Risks associated with weed species in this category are generally low. Benefits of initiating new management actions to contain or control spread along roads would be minimal.

Category II (High Risk) – Common weed species with potential for long-term site occupancy

These species are found along many roadsides on the Forest (estimate is 35-40% based on 2002 inventory work). Once established, they are not dependent on frequent disturbance for long-term site occupancy. Vehicles, heavy equipment,

and other human activities (yard waste disposal, animal feed, contaminated seed) have been documented or are suspected as long-range vectors for spread of many species in this category. Once established, these species have potential to disrupt natural successional pathways of forest vegetation. Most species in this category are listed on the Oregon Department of Agriculture's Noxious Weed List. Examples of plants in this category include Scotch broom, Himalayan berry and Evergreen blackberry.

Scotch broom

Risks associated with weed species in this category are high. Initiating management actions to contain established populations and prevent weed spread along roads would be beneficial. Implementation of management actions along primary and secondary roads traversing areas of the Forest where these species are not present, such as the Mary's Peak Scenic Botanical Area, would provide the greatest benefits.

Category III (Very High Risk) – Uncommon weed species with potential for long-term site occupancy

These species are found or suspected in only a few locations on or adjacent to the Forest. Once established, they are not dependent on frequent disturbance for long-term site occupancy. Vehicles, heavy equipment, and other human activities (yard waste disposal, animal feed, contaminated seed) have been documented or are suspected as long-range vectors for spread of many species in this category. Once established, these species have potential to disrupt natural successional pathways of forest vegetation. These species pose the greatest threat of spread along forest roads with potential adverse effects to ecosystem function and natural processes (Miller, personal communication). All species in this category are listed on the Oregon Department of Agriculture's Noxious Weed List. Examples of plants in this category include purple loosestrife, Portuguese broom and gorse.

Risks associated with weed species in this category are very high. Initiating management actions to contain and control established populations and prevent the spread of weeds in this category along roads is critical to maintaining ecosystem function and resource values. Measures to contain known infestation sites and prevent the spread of weeds in this category have been implemented in some areas where primary and secondary roads traverse known infestation sites. New infestations and new species that fit this category and further increase risk are anticipated in the future (Steinmaus 2002).

Most risk of weed infestation is associated with primary and secondary roads that are regularly maintained for public use and new construction of "temporary" roads associated with timber harvest activities. Closed roads and roads that are not regularly maintained (storm-proofed and allowed to "grow-in") pose a relatively low risk of weed infestation to category II and III weeds (Parendes 1997).

Desired Future Condition

New detections of category II and III weeds show a decreasing trend annually with no increases in percent cover of weeds along roadsides. Weed prevention measures are incorporated into all project planning and implementation including timber sales, service contracts, construction contracts, special use permits and force account work. Site-specific management plans are in place to contain, control and prevent the spread of category III weeds as new sites and/or species are detected.

Recommendations

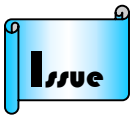
The following weed prevention measures for road corridors should be considered and, where applicable, included when planning and implementing work (USDA 2001a).

- **Equipment cleaning** – Require equipment cleaning for:
  - ⇨ All equipment brought onto the Forest;
  - ⇨ All equipment moved from infested areas (category II and III weeds) to uninfested areas; and
  - ⇨ Equipment moved from anywhere into an uninfested sensitive area (such as Mary's Peak).

  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.
- **Competitive seeding** – Seed disturbed sites lacking canopy cover using native species seed mix. Consult with Forest botanist for current seed mix, seeding window and fertilizer prescription.
- **Maintain Canopy Cover** – Maintain existing canopy cover to the extent possible when designing new roads or marking clearing limits for temporary roads.
- **Certified Weed free Seed** – Use only certified weed-free seed for roadside revegetation. Seed purchased should be tested using the All States Noxious Weed List.
- **Weed-Free Rock Sources** – Consider development of a quarry certification program and use only weed-free rock sources for road construction and maintenance.
- **Close roads** – Close Forest roads not needed for the foreseeable future. Gated 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.
- **Quarantines** – Consider the use of Oregon Department of Agriculture quarantines (ORS 561.510 & 561.540, 2001) if needed for new weed species or plant pathogens.
- **Inventory** – Conduct annual weed inventory of the Forest road system and maintain a current GIS weed inventory layer available for use by project planners and implementation personnel.
- **Internal and External Weed Education** – Address weed issues during school presentations and interpretive walks. Provide increased awareness of weed issues and prevention methods within the Forest Service workforce through training sessions and presentations during workforce meeting.

Social Issue

Wildfire Occurrence and Suppression



- **Roads influence wildfire occurrence and suppression by increasing human access to the Forest.**

Current Situation

Road systems within the national forest system, serve a very important purpose in the suppression of wildfires. Fire Regimes are based on frequency and intensity of wildfires across the land base. Areas with a long fire return interval of hundreds of years are usually high intensity stand replacement events over a large-scale area and occur during the most severe dry weather patterns for those areas. 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. In addition, the road system increases access to humans, thereby increasing the incidence of human caused fire ignitions.

On the Westside of the Siuslaw National Forest, the fire suppression effort is a cooperative effort between Oregon Department of Forestry (ODF) and the US Forest Service (USFS) working under a cooperative agreement. When the USFS decommissions roads, that action can affect the ability of cooperators to access lands for which they have fire protection responsibility. These roads need to have ODF oversight and agreement.

In general, roads have to be evaluated on a case-by-case basis while maintaining the big picture, sub-basin approach. On the Westside, if we can limit public access, we normally can limit the risk of human caused wildfires. However, in the event that we do incur fires with poor accessibility, the risk of a catastrophic event occurring is greatly increased.

Risks and Benefits

The majority of fire ignitions are human caused, as lightning is a rare event or is accompanied by rainfall amounts that keep fires small. The level of public access to the Forest is commensurate with the risk of a fire ignition during severe fire weather conditions. Access that allows the public to drive over waterbars, but hampers access by fire equipment is the worst-case scenario. Roads that are gated or block public access during fire season, but still maintain access for administrative use in order to fight wildfires are the best-case scenarios. However, funds for the best-case scenario transportation systems are not available and wildlife and hydrologic systems do not benefit from maintaining a high road intensity level.

Roads provide access to fire engines

Another risk is that the amount of commercial thinning on the Siuslaw is creating an increase in fuel loading above historic levels without generating a level of funding to properly treat hazardous fuels on the ground. Therefore, 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.

Risk to the public in areas with poor accessibility could result in higher property damage and a greater risk of the fire spreading to national Forest lands. 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.

The amount of road system left intact and accessible is a real key to the fire suppression effort, especially where adjacent private landowners are in the process of harvesting their lands or have the potential to harvest their lands in the future. The majority of these lands are located in the valley bottoms with national Forest lands above them on the ridge tops. Thus, the road system positioned on ridge tops soon become the best alternative for firebreaks and control lines.

Desired Future Condition

The Key Road system is maintained to a high standard that provides safe access for fire suppression crews and equipment. Ridgetop roads are maintained and regularly cleared of brush for potential use as fuel breaks.

Access to water in the stream bottoms is maintained. Road systems that lead to these areas are identified in pre suppression plans and maintained as a key component of the fire suppression effort. Suppression actions are undertaken quickly and initial attack objectives minimize the amount of acres burned.

Recommendations

- 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.
- Identify key water sources at the district level and maintain road access to these key water sources.
- Consult with suppression cooperators when determining which roads to close or decommission.
- For Firefighter Safety: Roads accessible by fire equipment should be accurately mapped and signed, and this information provided to firefighters to support effective suppression/pre-suppression strategies and avoid potential entrapment.

  This information should also reside in the Forest Geographic Information System (GIS) for use at the appropriate scale based on fire size and location.
- Ridgetop roads should be maintained to serve as firebreaks and control lines.

Road access assists wildland firefighters

4 KEY RECOMMENDATIONS

Project Design

Strategic Planning

- Use the Key Road system as the basis for making site-specific road management decisions. If needed, adjust the Key Road system to meet changing needs and conditions over time (pp. 12, 15).
- Follow recommendations of watershed analyses and the Forest Restoration Plan (USDA 2002) (pp. 17, 18, 19, 20, 23, 24, 25, 26).
- Maintain access to private lands (page 15).
- Maintain linkages between State Highway 101 and the county road system, as well as the east-west flow of local community and emergency traffic over the Oregon Coast Range. If budget shortfalls limit maintenance of the Key Forest Road system to standard, consider site-specific maintenance as problems arise (page 15).
- 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, adjustments or modifications to the Key Road system can be addressed at the watershed/project scale analysis (page 15).
- Consult with suppression cooperators when determining which roads to close or decommission (page 34).
- Ridgetop roads should be maintained to serve as firebreaks and control lines (page 34).
- Limit roadside salvage sales to the Key Forest Roads (page 28).

Site-Specific Planning

- Identify roads at risk for resource damage. Close, decommission or stabilize them. Seek alternative routes where possible.
    - ⇨ Mid-slope roads (page 20).
    - ⇨ Roads with a high risk of landslides (pp. 17, 20)
    - ⇨ Roads adjacent to low-gradient streams and floodplains (page 20).
    - ⇨ Reduce or eliminate impacts to coho salmon (page 23).
    - ⇨ Reduce disturbance of coho salmon (use of dispersed areas) (page 23).
- Consider the following factors in determination of impacts on fish and other aquatic resources (page 25):
    - ⇨ Type, condition, and number of stream crossings at a road-segment scale.
    - ⇨ Road-segment interaction with a stream's floodplain, where the road is parallel to the stream.
    - ⇨ Road surface type.
    - ⇨ Culvert fill-failure risk.
    - ⇨ Sustained steep (>15%) road grades in excess of 500 feet.
    - ⇨ Percent of road with sideslopes >51%.
    - ⇨ Road maintenance records. At a minimum, a record of maintenance accomplished (date, type), including knowledge of site-specific chronic or severe maintenance sites should be documented.

  - ⇨ Documentation of known spawning reaches with review by state and other agency biologists.
  - ⇨ Track temporary road locations, construction, and decommissioning or obliteration. This information is required in ESA consultation, but is not currently tracked in the Forest road database.
- Minimize disturbance to wildlife and fish resources by:
  - ⇨ Closing or restricting access to roads used intermittently for forest management activities (pp. 23, 28).
  - ⇨ Decommissioning unneeded roads (page 28).
  - ⇨ Minimizing the effect of noise from road maintenance, reconstruction or decommissioning by managing the seasonal and hourly operating periods of projects (page 28).
  - ⇨ Prohibiting the operation of ATV (All Terrain Vehicles) and other vehicles on closed or decommissioned roads by using road closure devices and administrative regulations (page 28).
- Where fish passage is affected, use an interdisciplinary process in the design of culverts (*e.g.,* fisheries biology, engineering, geomorphology, hydraulics, hydrology) (page 26).
- Focus silvicultural treatment on stands accessible from the Key Road system and other hydrologically stable roads (*e.g.,* ridgetop roads). Roads that will be decommissioned may be used for silvicultural treatment prior to decommissioning (page 29).

Road Construction and Maintenance

- 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 (page 34).
- Inventory annual and deferred maintenance needs of the Key Forest Road system. Prioritize road maintenance work to ensure resource protection and user safety within current Forest budgets (page 10).
- Consider alternative funding sources for road maintenance and repair (page 12).
- Identify roads at risk for resource damage. Close, decommission or stabilize them. Seek alternative routes if possible.
  - ⇨ Roads chronically increasing fine sediment in aquatic habitat (page 24).
  - ⇨ Roads with a high risk of landslides (pp. 17, 20).
  - ⇨ Close Forest roads not needed for the foreseeable future. Gated 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 (page 32).
  - ⇨ Prioritize repair and upgrade of culverts based on risk of failure and impact to fish passage and other aquatic resources (page 26).
- A partial list of references for road closure and obliteration:
  - ⇨ A Guide for Road Closure and Obliteration in the Forest Service (Moll 1996).
  - ⇨ Forest Road Obliteration and Upgrade Guide (USDA 1995b).
  - ⇨ Waterbar Placement and Construction Guide for Siuslaw Forest Roads (USDA 1998a).

Road Treatments

- When closed roads are reopened, use minimal impact techniques (page 29). For example:
  - ⇨ Keep clearing width to a minimum.
  - ⇨ Avoid sidecasting clearing debris and rootwads.
- Match road design with season of operation (*i.e.,* rock to support winter haul; rock north slopes when hauling during rainy season) (page 29).
- Waterbars:
  - ⇨ Install and maintain surface crossdrains (*e.g.,* waterbars, grade dips, outslope drains, *etc*.) on roads not designated for passenger cars (page 18).
  - ⇨ Install and maintain surface crossdrains (*e.g.,* waterbars, grade dips, outslope drains, *etc*.) on secondary high clearance roads to allow water from the ditch line to travel across the road surface to the slope below. This would dissipate water intercepted by cutbanks and prevent it from being delivered directly to stream channels (page 19).
  - ⇨ Disconnect road system from stream channels by waterbarring roads wherever possible. This would deliver water as naturally as possible to the slope below the road rather than concentrating runoff along ditch lines to the nearest stream, thereby extending the stream network artificially (page 19).
  - ⇨ Provide temporary drainage such as waterbars for wet areas (*e.g.,* seeps, springs). Reestablish natural drainage prior to road closure (page 29).
- Rock:
  - ⇨ Provide an adequate covering of rock on roads that will remain open (page 18).
  - ⇨ Use Weed-Free Rock Sources – Consider development of a quarry certification program and use only weed-free rock sources for road construction and maintenance (page 32).
- Vegetation:
  - ⇨ Leave ditches vegetated as often as possible. Vegetation acts as a filter and reduces the amount of fine sediment that reaches stream crossings (page 18).
  - ⇨ Maintain existing canopy cover to the extent possible when designing new roads or marking clearing limits for temporary roads in order to reduce invasive noxious weed species (page 32).
- Seeding:
  - ⇨ **Competitive seeding** – Seed disturbed sites lacking canopy cover using native species seed mix. Consult with Forest botanist for current seed mix, seeding window and fertilizer prescription (page 32).
  - ⇨ **Certified Weed free Seed** – Use only certified weed-free seed for roadside revegetation. Seed purchased should be tested using the All States Noxious Weed List (page 32).
- To control spread of noxious weeds, require equipment cleaning for:
  - ⇨ All equipment brought onto the Forest;
  - ⇨ All equipment moved from infested areas (category II and III weeds) to uninfested areas; and
  - ⇨ Equipment moved from anywhere into an uninfested sensitive area (such as Mary's Peak).

  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 (page 32).
- Consider the use of Oregon Department of Agriculture quarantines (ORS 561.510 & 561.540, 2001) if needed for new weed species or plant pathogens (page 32).

- Where fish passage is affected, use an interdisciplinary process in the design of culverts (*e.g.,* fisheries biology, engineering, geomorphology, hydraulics, hydrology) (page 26).
- Restrict timber haul on sensitive roads to the dry season. If timber haul must take place during the wet season, monitor rainfall, and reduce or eliminate timber haul during rain events (page 18).

Inventory & Monitoring

- Inventory:
  - ⇨ Utilize the stream crossing inventory to identify all road-stream crossings (*i.e.,* culverts) on the Forest. Prioritize repair and upgrade of culverts based on risk of failure and impact to fish passage and other aquatic resources (page 26). Update as necessary.
  - ⇨ Annual weed inventory of the Forest road system; maintain a current GIS weed inventory layer available for use by project planners and implementation personnel (page 32).
- Identify and maintain road access to:
  - ⇨ Key water sources (page 34).
  - ⇨ Key access points to accommodate equipment needed for thinning stands (page 29).

Additional Analysis

- Explore options for learning about the effects of simplification of channel conditions at road crossings (*e.g.,* removal of roughness elements like large woody debris) on streamflows and fish habitat (page 23).
- Explore opportunities to learn more about the impact of fine sediment on aquatic species habitat and survival. Use floods as an opportunity to learn more about stream dynamics (page 24).
- 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 (page 25).

Other

- For Firefighter Safety: Roads accessible by fire equipment should be accurately mapped and signed, and this information provided to firefighters to support effective suppression/pre-suppression strategies and avoid potential entrapment (page 34).

  This information should also reside in the Forest Geographic Information System (GIS) for use at the appropriate scale based on fire size and location.
- Internal and External Weed Education – Address weed issues during school presentations and interpretive walks. Provide increased awareness of weed issues and prevention methods within the Forest Service workforce through training sessions and presentations during workforce meeting (page 32).

GLOSSARY

*Road terms are defined in FSM 7705 (*USDA *2001b). Some terminology has been updated, and is therefore different than that described in the 1994 ATM Guide in Appendix B.*

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.

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.

Debris Flow "A debris flow is a highly mobile slurry of soil, rock, vegetation, and water that can travel thousands of yards from its point of initiation and usually occurs in steep (greater than approximately 6 degrees) and confined mountain channels. Debris flows are initiated by liquefaction of landslide debris concurrently with failure or immediately thereafter as the soil mass and reinforcing roots break up. Erosion of additional sediment and organic debris in small and steep channels can increase the volume of the original landslide by 1000% or more, enabling debris flows to become more destructive as their volumes increase with distance traveled." (Benda Unknown)

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.

High Clearance Road **–** Suitable for standard pick-up truck travel.

Low Clearance Road **–** Suitable for passenger car travel.

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.

Grade dip A shallow, long, rolling dip in the road surface that intercepts surface water running on the road and in the road ditch and then deposits it over the outside edge of the road.

Interstitial In this document, small, narrow spaces between gravel particles.

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).

Open Roads A national forest system road open for vehicular use (*e.g.,* passenger cars, pickup trucks and commercial vehicles). National forest system roads are subject to administrative, seasonal, temporary, or permanent closure.

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)). Forest roads are not necessarily public roads.

Riprap Foundation or wall of broken rock thrown together irregularly.

Road A motor vehicle travelway over 50 inches wide, unless designated and managed as a trail. A road may be classified, unclassified, or temporary (36 CFR 212.1).

a. **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).

b. **Temporary Roads** 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).

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

a. **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.

b. **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).

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.

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.

Waterbar 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.

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APPENDIX A

Documentation of Roads Analysis Process Step 4

From USDA Forest Service publication FS-643

Roads Analysis: Informing Decisions about Managing the National Forest Transportation System

Ecosystem Functions and Processes

EF(1): What ecological attributes, particularly those unique to the region, would be affected by roading of currently unroaded areas?

Not addressed in this analysis because the Siuslaw is not expanding its currently classified road system. Any adjustments to the road system would be minor and generally temporary in nature. The net transportation system is getting smaller thereby reducing environmental impacts.

Reference: Aquatic Conservation Strategy, Northwest Forest Plan, page 18.

EF(2): To what degree do the presence, type, and location of roads increase the introduction and spread of exotic plant and animal species, insects, diseases, and parasites? What are the potential effects of such introductions to plant and animal species and ecosystem function in the areas?

Noxious weeds are addressed as a key issue on page 30 of this analysis. The others are not key issues on the Forest, and are deferred to site-specific project analysis, if applicable.

EF(3): To what degree do the presence, type, and location of roads contribute to the control of insects, diseases, and parasites?

Not addressed in this analysis since this is not a key issue on the Forest and is therefore deferred to site-specific project analysis, if applicable.

EF(4): How does the road system affect ecological disturbance regimes in the area?

See page 33 for a discussion about the effect of roads on wildfires. Other ecological disturbance regimes are not addressed in this analysis.

EF(5): What are the adverse effects of noise caused by developing, using, and maintaining roads?

See Terrestrial Wildlife issues, beginning on page 27.

Aquatic, Riparian Zone, and Water Quality

AQ(1): How and where does the road system modify the surface and subsurface hydrology of the area?

See Aquatics and Water Quality issue, page 16.

AQ(2): How and where does the road system generate surface erosion?

See Aquatics and Water Quality issue, page 16.

AQ(3): How and where does the road system affect mass wasting?

See Aquatics and Water Quality issue, page 16.

AQ(4): How and where do road-stream crossings influence local stream channels and water quality?

See Fisheries issues, beginning on page 21.

AQ(5): How and where does the road system create potential for pollutants, such as chemical spills, oils, de-icing salts, or herbicides, to enter surface waters?

Not addressed in this analysis. Defer to watershed/project level analysis.

Reference: The Siuslaw Forest Hazardous Materials Response Plan, March 15, 2000 provides operation direction in case of hazardous spills.

AQ(6): How and where is the road system "hydrologically connected" to the stream system? How do the connections affect water quality and quantity (such as, the delivery of sediments and chemicals, thermal increases, elevated peak flows)?

See Aquatics and Water Quality issue, page 16.

AQ(7): What downstream beneficial uses of water exist in the area? What changes in uses and demand are expected over time? How are they affected or put at risk by road-derived pollutants?

Not addressed in this analysis. Defer to watershed/project level analysis, if applicable.

AQ(8): How and where does the road system affect wetlands?

Key Forest Routes are generally above wetland areas. The Northwest Forest Plan ROD Standards and Guidelines RF-2 states that: "For each existing or planned road, meet Aquatic Conservation Strategy objectives by: … avoiding wetlands entirely when constructing new roads" (NWFP ROD, page C-32, RF-2(g)).

Defer to watershed/project level analysis, if applicable.

AQ(9): How does the road system alter physical channel dynamics, including isolation of floodplains: constraints on channel migration; and the movement of large wood, fine organic matter, and sediment?

See Aquatics and Water Quality issue, page 16.

AQ(10): How and where does the road system restrict the migration and movement of aquatic organisms? What aquatic species are affected and to what extent?

See Fisheries issues, beginning on page 21.

AQ(11): How does the road system affect shading, litterfall, and riparian plant communities?

Not a key issue on this Forest. See Fisheries issues for discussion (beginning on page 21). Defer to watershed/project level analysis, if applicable.

AQ(12): How and where does the road system contribute to fishing, poaching, or direct habitat loss for at-risk aquatic species?

It is recognized that the existence of the road system may contribute to a negative impact on aquatic species. However, this is not a key issue on this Forest due to seasonal fishing restrictions on anadromous fish (both listed and proposed for listing) by the State. See Fisheries issues for discussion (beginning on page 21).

AQ(13): How and where does the road facilitate the introduction of non-native aquatic species?

See Fisheries issues, beginning on page 21. Defer to watershed/project level analysis, if applicable.

AQ(14): To what extent does the road system overlap with areas of exceptionally high aquatic diversity or productivity, or areas containing rare or unique aquatic species or species of interest?

Not a key issue on this Forest. See Fisheries issues, beginning on page 21, for discussion. Defer to watershed/project level analysis, if applicable.

Terrestrial Wildlife

TW(1): What are the direct effects of the road system on terrestrial species habitat?

See Terrestrial Wildlife issues, beginning on page 27.

TW(2): How does the road system facilitate human activities that affect habitat?

See Terrestrial Wildlife issues, beginning on page 27.

TW(3): How does the road system affect legal and illegal human activities (including trapping, hunting, poaching, harassment, road kill, or illegal kill levels)? What are the affects on wildlife species?

See Terrestrial Wildlife issues, beginning on page 27.

TW(4): How does the road system directly affect unique communities or special features in the area?

Not addressed in this analysis, since it is not a key issue on this Forest. Defer to watershed/project level analysis, if applicable.

Economics

EC(1): How does the road system affect the agency's direct costs and revenues? What, if any, changes in the road system will increase net revenue to the agency by reducing cost, increasing revenue, or both?

See Economics issues, beginning on page 10.

EC(2): How does the road system affect the priced and non-priced consequences included in economic efficiency analysis used to assess net benefits to society?

Not addressed in this analysis, since this is not a key issue on this Forest. Scope is too broad for this level analysis. See the FEIS for the Northwest Forest Plan, Volume 1, "The Economy and Communities," pages 3&4-260 thru 3&4-319.

EC(3): How does the road system affect the distribution of benefits and costs among affected people?

Not addressed in this analysis, since this is not a key issue on this Forest. Scope is too broad for this level analysis. See the FEIS for the Northwest Forest Plan, Volume 1, "The Economy and Communities," pages 3&4-260 thru 3&4-319.

Commodity Production – Timber Management

TM(1): How does road spacing and location affect logging system feasibility?

Not addressed in this analysis because the Siuslaw is not expanding its currently classified road system. Timber is harvested only from existing plantations using or reopening existing roads. Defer to watershed/project level analysis.

TM(2): How does the road system affect managing the suitable timber base and other lands?

Not addressed in this analysis, since suitable timber harvest is not a key issue on this Forest. Most timber harvest on the Siuslaw National Forest is a byproduct of silvicultural treatments designed to promote late-successional forest development for recovery of threatened species. The current road system is considered adequate for such timber harvest. Defer to watershed/project level analysis if appropriate.

TM(3): How does the road system affect access to timber stands needing silvicultural treatment?

See Vegetation Management issue, beginning on page 28.

Commodity Production – Minerals Management

MM(1): How does the road system affect access to locatable, leasable, and salable minerals?

Not addressed in this analysis, since it is not a key issue on this Forest. Defer to watershed/project level analysis, if applicable (e.g., rock quarries).

Commodity Production – Range Management

RM(1): How does the road system affect access to range allotments?

Not addressed in this analysis, since it is not a key issue on this Forest (there is only one allotment on the Forest). Defer to watershed/project level analysis, if applicable.

Water Production

WP(1): How does the road system affect access, constructing, maintaining, monitoring, and operating water diversions, impoundments, and distribution canals or pipes?

Not addressed in this analysis, since it is not a key issue on this Forest. Defer to watershed/project level analysis, if applicable.

WP(2): How does road development and use affect water quality in municipal watersheds?

Not addressed in this analysis, since it is not a key issue on this Forest. Defer to watershed/project level analysis, if applicable.

WP(3): How does the road system affect access to hydroelectric power generation?

Not addressed in this analysis, since it is not a key issue on this Forest. Defer to watershed/project level analysis, if applicable.

Special Use Permits

SP(1): How does the road system affect access for collecting special forest products??

Not addressed in this analysis, since it is not a key issue on this Forest. Defer to watershed/project level analysis, if applicable.

SU(1): How does the road system affect managing special-use permit sites (concessionaires, communications sites, utility corridors, and so on)?

Not addressed in this analysis, since it is not a key issue on this Forest. Defer to watershed/project level analysis, if applicable.

General Public Transportation

GT(1): How does the road system connect to public roads and provide primary access to communities?

Specific primary and secondary route selection criteria (see below) are designed to include vital national forest system roads that connect to public roads and provide primary access to communities (for further discussion, see Community Impact issues, page 13). The maps of Key Forest Roads show how national forest system roads connect to public roads and provide access to communities (see Appendix C, page 93).

Primary route selection criteria (see page 14):

- Roads that link state and county roads, which connect high-use entry points or population centers and provide major access into and through the Forest.
- Among primary road alternatives, select the one that favors the greatest use of state and county road systems (these are usually double-lane roads and highways).

Secondary route selection criteria (see page 14):

- ❷ Routes that extend primary Forest roads as well as state and county roads, and give needed long-term access.

GT(2): How does the road system connect large blocks of land in other ownership to public roads (ad hoc communities, subdivisions, inholdings and so on)?

The road system makes connections to the BLM, State and County road systems which provide primary access to BLM public lands and blocks of privately held timber lands. Private timberlands are generally more scattered than either national Forest or BLM lands. Numerous connections are made through private lands to national Forest lands and through national Forest lands to private inholdings. Connections are made through both Key Forest roads and short-term use project roads.

GT(3): How does the road system affect managing roads with shared ownership or with limited jurisdiction? (RS 2477, cost-share, prescriptive rights, FLPMA easements, FRTA easements, DOT easements)

Roads with shared ownership are identified at the forest scale (see selection criteria page 14) and are included on the maps of Key Forest Roads (Appendix C). Such roads are managed in accordance with agreements determined at the project scale.

GT(4): How does the road system address the safety of road users?

The selection criteria for identifying the primary and secondary road system (page 14), are designed to result in a network of Key Forest Roads most traveled by the public and most needed for general forest management. It is well established that maintenance funding has not kept pace with maintenance needs. Issues related to the safety of road users are likely to be most significant on the network of Key Forest Roads. Road safety issues are addressed by the fact that limited road maintenance resources are prioritized to maintain safety features on Key Forest Roads.

However, it should be pointed out, that known safety deficiencies where risks are unacceptable are corrected on any national system road, including roads that are not on the network of Key Forest Roads.

Administrative Use

AU(1): How does the road system affect access needed for research, inventory, and monitoring?

Overall, miles of open road access on national Forest Service lands have been reduced under the ATM guidelines with a corresponding reduction in motorized access for research and inventory. Research and inventory will be more time consuming without vehicle access although this is not expected to have a significant impact since neither activity is extensive on the Siuslaw. Monitoring for effectiveness of project treatments likewise will have reduced motorized access and consequently higher costs.

AU(2): How does the road system affect investigative or enforcement activities?

The reduction in open roads has accompanied a reduction in Forest Service employees during the same time period, leading to a decrease in incident observation and reporting. The effect is a concentration of some illegal activities such as vandalism, theft of Forest Products and dumping of garbage along the Key Road system and remaining open short spur roads. As a result, Forest Law Enforcement Officers have spent an increasing amount of time responding to individual incidents

At the same time more serious illegal activity, such as drug manufacture and growing, are practiced on portions of the remaining non-Key Roads since the people conducting these activities realize that the number of Law Enforcement Officers are reduced and response is more difficult on the closed or grown over roads.

Protection

PT(1): How does the road system affect fuels management?

Not addressed in this analysis, since it is not a key issue on this Forest. There are very few planned fuel management treatments on the Siuslaw. Defer to watershed/project level analysis, if applicable.

PT(2): How does the road system affect the capacity of the Forest Service and cooperators to suppress wildfires?

The amount of road system left intact and accessible is a real key to the fire suppression effort as stated on page 33. Especially, where we have adjacent private landowners that are in the process of harvesting their lands or have the potential to harvest their lands in the future. The majority of these lands are located in the valley bottoms with national Forest lands above them on the ridge tops. Thus, the road system positioned on ridge tops soon become the best alternative for firebreaks and control lines. These types of roads should be maintained and brushed with this in mind.

The other item that needs to consideration is access to water in the stream bottoms. Road systems that lead to these areas need to be identified in pre suppression plans and maintained as a key component of the fire suppression effort. The shorter the distance to water from the fire area, the quicker the suppression action and the best opportunity to meet initial attack objectives of minimizing acres burned.

On the Westside, the fire suppression effort is a cooperative effort between Oregon Department of Forestry and the US Forest Service working under a cooperative agreement. When the Forest Service decommissions roads, that action can affect the ability of cooperators to access lands for which they have fire protection responsibility. These roads need to have ODF oversight and agreement. Road stability as it relates to water quality is one of the key issues for decommissioning roads. We have areas that with some forethought, we might be able to construct new access roads on ridge tops on private land that would allow both agencies to achieve their objectives.

In general, roads have to be evaluated on a case-by-case basis while maintaining the big picture, sub-basin approach. On the Westside, if we can limit public access, we normally can limit the risk of human caused wildfires. However, in the event that we do incur fires with poor accessibility, the risk of a catastrophic event occurring is greatly increased.

PT(3): How does the road system affect risk to firefighters and to public safety?

The amount of public access to the forest both for recreational use as well as accessing their private land through national Forest land is similar to the statements above, concerning working with our cooperators for fire suppression. Risk to the public in areas with poor accessibility could result in higher property damage and a greater risk of the fire spreading to national Forest lands. Roads that are only one way in and one way out 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.

Medical response time will be greatly increased in areas with limited access. Where recreational opportunities exist such as hiking trails, hunting, fishing and gathering of miscellaneous forest products, should a public medical emergency occur, it will take more time to reach these folks. These situations are rare, but do require some attention when evaluating different road intensity alternatives.

Roads determined to be Key Forest system roads do need to be maintained at a high level for quick response of emergency vehicles of all sizes and visibility for safe travel by both public and agency vehicles.

PT(4): How does the road system contribute to airborne dust emissions resulting in reduced visibility and human health concerns?

Not addressed in this analysis, since it is not a key issue on this Forest. In general, the climate is too wet for dust to be an issue on forest roads, especially since seasonal restrictions for fisheries and wildlife limit haul during the dry season. Defer to watershed/project level analysis, if applicable.

Recreation – Unroaded Recreation

UR(1): Is there now or will there be in the future excess supply or excess demand for unroaded recreation opportunities?

Not addressed in this analysis, since it is not a key issue on this Forest. Defer to watershed/project level analysis, if applicable.

UR(2): Is developing new roads into unroaded areas, decommissioning of existing roads, or changing the maintenance of existing roads causing substantial changes in the quantity, quality, or type of unroaded recreation opportunities?

Not addressed in this analysis, since it is not a key issue on this Forest. Defer to watershed/project level analysis, if applicable.

UR(3): What are the adverse effects of noise and other disturbances caused by developing, using, and maintaining roads, on the quantity, quality, and type of unroaded recreation opportunities?

Not addressed in this analysis, since it is not a key issue on this Forest. Defer to watershed/project level analysis, if applicable.

UR(4): Who participates in unroaded recreation in the areas affected by constructing, maintaining, and decommissioning roads?

Not addressed in this analysis, since it is not a key issue on this Forest. Defer to watershed/project level analysis, if applicable.

UR(5): What are these participants' attachments to the area, how strong are their feelings, and are alternative opportunities and locations available?

Not addressed in this analysis, since it is not a key issue on this Forest. Defer to watershed/project level analysis, if applicable.

UR(6): How is developing new roads into unroaded areas affecting the Scenic Integrity Objective, SIO(s)? Note: Some forests are still using the Visual Management System (VMS). If that is the case, substitute Visual Quality

Objective (VQO) for SIO. (Region 2 added this question. There is no corresponding national direction).

Not addressed in this analysis, since it is not a key issue on this Forest. Defer to watershed/project level analysis, if applicable.

Recreation – Road-Related Recreation

RR(1): Is there nor or will there be in the future excess supply or excess demand for roaded recreation opportunities?

As non-Key Forest Roads become inaccessible, are closed or decommissioned, fewer roads are available for roaded recreation opportunities. However, roads or lack thereof, will not be the limiting factor, causing demand to exceed supply. The capabilities of land and recreation facilities will be the limiting factors of future roaded recreation opportunities.

RR(2): Is developing new roads into unroaded areas, decommissioning of existing roads, or changing maintenance of existing roads causing substantial changes in the quantity, quality, or type of roaded recreation opportunities?

Not as long as the Forest retains the existing Key Forest Road system. There should be no change to the roaded recreation opportunities.

RR(3): What are the adverse effects of noise and other disturbances caused by constructing, using, and maintaining roads on the quantity, quality, or type of roaded recreation opportunities?

Retaining the existing Key Forest Road system will result in no adverse effects to the quantity or types of roaded recreation opportunities. Maintaining roads may create a temporary/transitory adverse impact to roaded recreation opportunities from effects like dust, noise, and travel delays.

RR(4): Who participates in roaded recreation in the areas affected by road constructing, changes in road maintenance, or road decommissioning?

This question is not applicable if the Forest intends to retain the existing Key Forest Roads.

RR(5): What are these participants' attachments to the area, how strong are their feelings, and are alternative opportunities and locations available?

This question is not applicable if the Forest intends to retain the existing Key Forest Roads.

RR(6): How does the road system affect the Scenic Integrity Objective, SIO(s)? Note: Some forests are still using the Visual Management System (VMS). If that is the case, substitute Visual Quality Objective (VQO) for SIO. (Region 2 added this question. There is no corresponding national direction).

Not addressed in this analysis, since it is not a key issue on this Forest. Defer to watershed/project level analysis, if applicable.

Recreation – Passive-Use Value

PV(1): Do areas planned for road constructing, closure, or decommissioning have unique physical or biological characteristics, such as unique features and threatened or endangered species?

Not addressed in this analysis, since it is not a key issue on this Forest. Road construction would only occur on a minor and generally temporary basis. Closure or decommissioning a road would yield a net benefit to wildlife species despite short-term disturbance issues, which would be mitigated by seasonal restrictions. The same would be true for any unique physical characteristics, since road access to such features would be reduced.

For site-specific analysis, defer to watershed/project level analysis, if applicable.

PV(2): Do areas planned for road construction, closure, or decommissioning have unique cultural, traditional, symbolic, sacred, spiritual, or religious significance?

Not addressed in this analysis. Consultation with the Confederated Tribes of Siletz, Confederated Tribes of Grand Ronde, Confederated Tribes of Coos, Lower Umpqua and Siuslaw, and, on specific coastal issues, with the Coquille Indian Nation occurs and is addressed during watershed/project level analysis.

PV(3): What, if any, groups of people (ethnic groups, subcultures, and so on) hold cultural, symbolic, spiritual, sacred, traditional, or religious values for area planned for road entry or road closure?

Since the spectrum of people using the Siuslaw National Forest is so broad, passive-use values for areas planned for road entry or closure/decommissioning are equally diverse and often mutually exclusive. Public involvement is encouraged and incorporated during project level analysis. However, this specific question is not addressed in this analysis.

PV(4): Will constructing, closing, or decommissioning roads substantially affect passive-use value?

Passive-use values reflect the spectrum of people, from those who would like improved, increased access to all areas of the Forest to those who favor decreasing the density of the road system because they value other forest characteristics that are incompatible with roads. Public involvement is encouraged and incorporated during project level analysis. However, this specific question is not addressed in this analysis.

Social Issues

SI(1): What are people's perceived needs and values for roads? How does road management affect people's dependence on, need for, and desire for roads?

As stated above, the perceived need for and value of roads varies across a broad spectrum. Some people value the access that the road system provides; others would rather have larger unroaded or Roadless areas. Local communities within and adjacent to the Siuslaw National Forest are sometimes dependent on the Key Forest Routes for access, which is addressed more fully on page 13.

SI(2): What are people's perceived needs and values for access? How does road management affect people's dependence on, need for, and desire for access?

One of the main issues regarding roads on the Siuslaw is access. This is discussed more fully in the discussion under Access and Community Impact issues, beginning on page 13.

SI(3): How does the road system affect access to paleontological, archaeological, and historical sites?

Access to these sites is generally not encouraged unless the sites have been evaluated, protected and are serving as interpretive or educational features associated with recreation sites and primary access routes. As such, the current level of access on the Key Road System will be maintained and access on the non-Key Roads will be reduced over time as roads are closed or decommissioned. Closing and decommissioning will reduce potential disturbance associated with motorized access on known historic sites, which are often located near valley bottom roads in the Coast Range. If needed, analysis is expected to be at the watershed or project level.

SI(4): How does the road system affect cultural and traditional uses (such as plant gathering, and access to traditional and cultural sites) and American Indian treaty rights?

American Indian treaty rights are outside the scope of this analysis. Traditional plant gathering and access to cultural sites accommodated by the road system of the early 1990s will require additional walking or other means of access similar to gathering commercial and personal use Forest Products. If needed, analysis is expected to be at the watershed or project level.

SI(5): How are roads that constitute historic sites affected by road management?

Not addressed in this analysis, since it is not a key issue on this Forest. Defer to watershed/project level analysis, if applicable.

SI(6): How is community social and economic health affected by road management (for example, lifestyles, businesses, tourism industry, infrastructure maintenance)?

Specific primary and secondary route selection criteria (see below) are designed to keep access open to developed recreation sites, campgrounds, scenic routes, trailheads, and facilities of special interest. Such roads are identified and placed on the maps of Key Forest Roads (see Appendix C, page 93). Maintaining the infrastructure to these sites promotes business and tourism within the local communities.

Primary route selection criteria (see page 14):

- ❶ Roads that help provide the most extensive linkage to secondary networks.
- ❶ Roads that are designated scenic routes or auto tours.

Secondary route criteria (see page 14):

- ❷ Roads that access developed sites, wilderness trailheads, multiple resource management areas, and special sites and facilities that require permanent vehicle access.

SI(7): What is the perceived social and economic dependency of a community on an unroaded area versus the value of that unroaded area for its intrinsic existence and symbolic values?

The intrinsic existence and symbolic value of an unroaded area is difficult if not impossible to measure. Again, its value differs based on individual perspective. The social and economic dependencies of rural communities using forest roads is addressed in this analysis (see page 13).

SI(8): How does road management affect wilderness attributes, including natural integrity, natural appearance, opportunities for solitude, and opportunities for primitive recreation?

There are three wilderness areas on the Siuslaw National Forest, all surrounded by forest roads. Certainly the edges of the wilderness areas are affected by the road system. However, these concerns, balanced by community needs for access and budget concerns, are best addressed at the watershed/project level.

SI(9): What are traditional uses of animal and plant species in the area of analysis?

Not addressed in this analysis. Traditional uses vary by locality and the presence of individual plant and animal species across the Forest. Analysis is expected to be at the watershed or project level.

SI(10): How does road management affect people's sense of place?

A sense of place is an individual issue. The majority of Forest visitors utilize motor vehicles to travel to their destinations, such as campgrounds, boat landings, picnic areas, swimming beaches, trailhead parking areas, etc. Forest roads also provide motorized access for gathering special forest products, such as mushrooms, conifer boughs, etc. On the other hand, many people feel that there is an intrinsic value ("sense of place") to unroaded and wilderness areas. This is not a key issue on the Siuslaw; however, the issue of Community Impact is addressed in this analysis on page 13.

Civil Rights and Environmental Justice

CR(1): How does the road system, or its management, affect certain groups of people (minority, ethnic, cultural, racial, disabled, and low-income groups)?

On the Siuslaw, the main issue affecting groups of people is access (page 13). Consultation with the Confederated Tribes of Siletz, Confederated Tribes of Grand Ronde, Confederated Tribes of Coos, Lower Umpqua and Siuslaw, and, on specific coastal issues, with the Coquille Indian Nation occurs and is addressed during watershed/project level analysis. Access for people with disabilities is also addressed at the watershed/project level.

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Appendix B

Siuslaw Access and Travel Management Guide

September 1994

Prepared by the Forest A&TM Guide Task Group:

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Editor's Note:

Appendix 1 (ATM road network) from the 1994 Siuslaw ATM Guide is not included in this document. Updated Tables and Maps of the Key Forest Roads (formerly ATM roads) can be found in Appendix C.

I. INTRODUCTION

The Siuslaw National Forest has about 2,400 miles of roadway, 117 miles of trail, and approximately 700 miles of state and county roads within its boundaries. Cars, trucks, motorcycles, horses, bicycles, wheelchairs, pedestrian, and other modes of transportation traverse these many roads and trails for recreation, resource management projects, and private property use. This variety of uses and demands makes management of the Forest transportation system a complex task. The Forest must provide many different recreational experiences and management opportunities, and at the same time protect resources, minimize safety hazards, and reduce user conflicts. **Access and travel management is a public, interagency, and interdisciplinary process that accomplishes Management Area direction as stated in the Siuslaw National Forest Land and Resource Management Plan (Siuslaw Forest Plan).**

The purpose of the Siuslaw National Forest Access and Travel Management (A& TM) Guide is to provide clear and consistent direction throughout the Forest for road and trail management decisions. It promotes both safe access for travelers and protection for natural resources.

Historically, the Siuslaw National Forest emphasized timber management. A large road system resulted to gain access to timber and other Forest resources. Timber sale revenue paid for the majority of past road construction and road maintenance. Today, however, timber harvest on the Forest is declining with the shift toward ecosystem management. The Siuslaw National Forest is committed to ecosystem management, which considers the role, importance, and interdependency of all resources, including people. The A&TM Guide reflects this commitment and the philosophy that the Forest and its travel corridors are open unless designated otherwise. However, this change in forest management has seriously reduced the Forest's operating budgets and ability to maintain an extensive road system. Therefore, some roads will be removed from the system, others closed until future access is needed, and many others kept at lowest possible maintenance levels.

The A&TM Guide presents an orderly and integrated method of dealing with this situation. The A&TM Guide provides the vision, goals, objectives, criteria, and guidelines for managing access within the Forest during the next 5 to 10 years. The Guide is responsive to public concerns and resource management needs, and concurs with current policies and direction, including the Siuslaw Forest Plan and the President's Forest Plan.

The A&TM Guide does not address off-road vehicle (ORV) use on the Oregon Dunes National Recreation Area. That subject is dealt with in the Environmental Impact Statement to the Oregon Dunes National Recreation Area Management Plan. ORV use is also identified in another guide for Sand Lake, Hebo Ranger District.

II. VISION

The Siuslaw National Forest envisions a less extensive road system and an expanded trails network. This system will allow travel across the Forest and provide reasonable access to major points of interest and resource management areas. To achieve such a system and meet management objectives, the Forest identified a "primary" and "secondary" roads network with additional trail access opportunities.

The **primary** system of roads will handle the majority of Forest visitor and other travel needs. These roads will be identified in the Forest Visitors Map as the best travel routes. Clear directional and informational signing along roads will also identify them. Roadside recreation, trailheads-and- view points will be featured along these roads.

Secondary roads complete a network of vital inter-forest connections. They lead recreationists, resource managers, permittees, land owners, and emergency services along direct routes into and across all areas of the Forest by connecting with short roads to trailheads, project sites, special use areas, development sites or private lands.

Two levels of roads, low clearance and high clearance, make up the secondary road system. Passenger cars will be able to easily travel over low clearance roads, whereas vehicles like trucks will be recommended for high clearance roads, especially during rainy periods.

Access & Travel Future Conditions – "Snapshot 2000"

- The road network most traveled is the **primary** system with **secondary** connections to recreation sites and special use areas. All travelers are able to view a diversity of landscapes throughout the forest, and all recreation areas containing developed sites are accessed by these roads.
- Directional signing and maps are effective in guiding Forest- visitors along the **primary** system and **secondary** roads. The best Forest entry and exit points are clearly signed.
- Routes encouraging travel allow all people, including those with disabilities, to enjoy activities such as hunting, fishing, camping, hiking trails, visiting viewpoints and sight-seeing.
- Roads that pose a hazard to riparian areas have been eliminated and restored to vegetation production.
- Some roads within riparian areas or along scenic routes have been converted to trails.
- In the absence of further maintenance, almost all former timber access spurs are closed with travelways cross-ditched and bermed to effectively disperse water runoff. A preference for camping on certain landings will keep only a few short roads open by regular use from hunters and campers.

- Considerably less roads are open to highway vehicle travel, reflecting a new era in forest management and recreation demands.
- Areas not scheduled for timber harvest and riparian reserve areas have few open roads remaining. Some obliterated roads have become part of trail systems. Areas outside of riparian reserves maintain a higher density of roads. Timber management areas maintain the majority of local roads in a continual state of flux from closed to open, in managing for intermittent project access.
- Some former roadbeds are being managed in forage for big game in areas that show good capability and desirability for habitat.
- Secondary roads maintained for high clearance vehicles appear narrow and well worn. Some of these have shallow drain dips constructed to disperse water off road in locations adjacent to sites prone to collect and erode in the event of storms. Entrances to these roads warn of rough road conditions. Passenger cars are still capable of using most of these secondary roads in fair weather, by traveling slow and avoiding obstacles that have fallen within the travelway.
- Entrances to other roads stemming from primary and secondary routes have devices, such as dips and berms that allow travelers to determine whether or not they want to drive the road. Where possible, entrance or closure devices are set far enough in so that they allow travelers room to turn around or park off road and explore. Vegetation will naturally close many of these entrances.
- A number of old trails have been extended as roads that once accessed them were converted to be part of the trail. A few trail networks tie former roads into loop experiences and provide cultural and historic interpretation.
- The Corvallis-To-The-Sea Trail has gained both Regional and National recognition in providing a variety of recreation experiences for people on foot, horseback, and bicycle. People will experience rural to semi-primitive settings as they travel the trail. Trail networks show a high variety of uses including overnight and day trips.
- • Special forest products operations, such as gathering greenery, are using innovative methods for transporting products over trails and closed roads. When needed, these operators help maintain roads and trails that would otherwise not be suitably accessible for their purposes.

III. DIRECTION AND POLICY

Authority

A number of Federal laws give the Forest Service the authority to develop and manage an integrated road and trail system:

- The U.S. Code of Federal Regulations (CFR) contains traffic management and traffic engineering regulations for National Forest roads. Through the CFR, the Forest Supervisor has the authority to implement traffic rules and issue Federal

Orders that close or restrict National Forest road and trail use. (Refer to the Forest's "Road Rules".)

- The Siuslaw Forest Plan contains general direction for A&TM.
- Forest Service Manuals and Handbooks address transportation planning, operation, and maintenance.
- Executive order 11989 requires each National Forest to look for off-road vehicle use opportunities. These opportunities must be compatible with all resources, provide safety for all users, and produce minimal conflicts among various user groups.
- The Forest Service and Federal Highway Administration have agreed that Highway Safety Act standards apply only to roads normally maintained for the standard passenger car. Although state, highway and county roads are found within the Siuslaw, the Forest Service has jurisdiction only over national forest roads.

Policy

The A&TM Vision for the Siuslaw National Forest is based on the following policies and responsibilities, taken from the Forest Service Manual:

- 7730-94-1

  "National Forest Lands belong to the people. They have the right to access and use these lands. They must be involved in the development of the travel management policies that consider the development, maintenance, and protection of all Forest resources ... They want to know how and where they can travel. They, too, care for the land and will understand the reasons for managed access."

- 7705

  "Forest development roads are not public roads...[and]...are not intended to meet the transportation needs of the public at large. Instead, they are authorized only for the administration and utilization of national forest system lands. Although generally open and available for public use, that use is at the discretion of the Secretary of Agriculture."

- 7731.1

  "Restrictions of access and travel should be the minimum necessary to achieve approved management objectives... and user safety, environmental considerations and economics." Roads will be "operated and maintained... in a manner to provide cost effective support of resource management direction and safe travel for users of the system while protecting the environment, adjacent resources, and the public investment."

- • 7731.13

  "The Forest Service cannot deny reasonable access over existing roads to any person desiring to reach their private land...Roads may be closed to general use; however,...The property owner must be liable for any maintenance and damage to. closed roads as a result of such use."

IV GOALS AND OBJECTIVES

A. Public Involvement

The Siuslaw National Forest recognizes that many people use the Forest road system. These people. include recreationists, contractors, permittees, private landowners, special interest groups, public utilities, local communities, other agencies (local, state and federal), and Forest Service employees. These people have specific interests in various levels of road access and maintenance.

While A&TM planning must be responsive to public concerns, it must also be consistent with current policies and budgets, Memoranda of Understanding, Forest Service Manual direction, and Siuslaw Forest Plan direction.

Goal

Consistently involve a wide range of publics throughout A&TM Guide development, from scoping to decision making.

Objectives

- Develop an awareness, both internally and externally, that the Siuslaw National Forest is modifying how it manages its road system, and that current funding and ecological concerns will help determine maintenance levels.
- Develop and distribute appropriate and understandable informational materials so that a common understanding exists between publics and Forest Service managers on current management policies, legal and policy guidelines, funding constraints, management options, A&TM objectives, proposed policies, and implementation programs.
- Clearly explain to publics how and when they can help define the issues and alternatives, as well as how to keep informed of these.
- Explain the basis of decisions.
- Provide means for publics to participate in and respond to changes in road and trail management decisions.

B. Resource Management

Paramount to A&TM is the protection of the Forest's basic resources of soil, water, fish, wildlife, and vegetation. The Forest road and trail system affects these resources and people desiring to enjoy them. Access into prime habitat areas can increase the vulnerability of animals and cause a re-distribution into less desirable areas. These same travelways also provide access for recreation and resource management projects. Human access into remote areas can disturb wildlife and sensitive plants. An A&TM strategy must consider the needs of both resources and people.

Fish and Watershed

Goal

Maintain or improve fish habitat in watersheds.

Objectives

- The Siuslaw National Forest Watershed and Anadromous Fish Strategic Plan along with subject watershed analysis recommendations should help determine road management, decisions.
- Give priority to key watersheds in relatively good health, as identified in the Strategic Plan, for road reconstruction, maintenance, or obliteration projects.
- Use a Forest landslide risk assessment and surface erosion module to help prioritize roads in key watersheds for restoration and obliteration.
- Consider reconstructing or obliterating roads, depending on vehicle access and travel needs, with the greatest potential for resource damage.
- Where roads are identified for obliteration, consider obliteration techniques that expedite recovery of degraded watersheds and minimize sedimentation.
- Consider road closure if intermittent use and subsequent maintenance are a detriment to a healthy watershed. Consider road obliteration when "stabilization" techniques on closed roads are not adequate and other access means can be achieved.

Wildlife

Goal

Consider wildlife habitat capability and the amount and type of recreation associated with wildlife in all road management decisions.

Objectives

- Consider Federally-listed threatened and endangered, or regionally-listed sensitive species and their habitats in road management decisions.
- Use road management strategies to enhance opportunities in wildlife viewing and hunting by providing a diversity of access means and recreation experiences.
- Protect threatened and endangered anadromous fish stocks by significantly reducing sedimentation and landslide hazards from roads in key watersheds.

- Where roads are to be obliterated, consider forage seeding of these in high elk capability areas.

Vegetation

Goal

Determine access to current or planned vegetation management projects in the A&TM planning process prior to road closure or obliteration.

Objectives

- Consider alternate means to managed stands for silvicultural treatments as roads are closed or obliterated.
- Consider fire suppression access needs of adjacent public and private lands in road access decisions.
- Coordinate with adjacent fire districts and landowners on changes in road access.

C. Recreation

The Siuslaw National Forest has an abundance o£ recreation opportunities in the interior Coast Range and along the Oregon Coast. Public demand for recreation appears to be growing as populations increase in the Pacific Northwest. The existing Forest transportation system provides access to a variety of dispersed and developed recreation facilities and areas, trails and trailheads, scenic landscapes, and special areas, including wilderness. Therefore, as the current transportation system changes, the important role that recreation plays on the Forest must be fully considered.

Goal

Emphasize the recreation objectives outlined in the Forest Plan, particularly those objectives which provide forest access from the urban Willamette Valley, and promote recreation opportunities linking the coast with inland forest.

Objectives

- Maintain a recreational transportation system that provides access to various recreation opportunities in the Oregon Coast Range and along the coast.
- Give maintenance and enhancement priority to roads that access existing developed and dispersed recreation sites and areas, and keep these roads as part of the primary or secondary road system.
- Maintain some roads that provide dispersed recreation opportunities for auto touring, hunting, fishing, and camping, within expected outputs.

- Retain as part of the secondary road system those roads that provide access to proposed recreation developments or potential recreation sites, heritage resources, or attractive scenic features.
- Link the recreation transportation system to the county, state and federal road systems which provide opportunities for inland forest and coastal recreation.
- • Maintain the recreation transportation system to meet the changing recreational demands of the Oregon Coast and Coast Range as reflected in the Forests Capital Investment Program and public input, including equestrian travel, mountain biking, and off-road vehicle use.

Goal

Provide a recreational road system that is sensitive to existing proposed facilities and areas, heritage resources, special management areas, and wilderness values.

Objectives

- Identify level of maintenance for roads that matches and promotes the designated Recreation Opportunity Spectrum (ROS) experience for that Forest Management Area.
- Consider the historical (National Register of Historic Places) value of a road or road system during watershed and project level analysis.
- Consider on-site interpretation of roads with historic value as part of interpretive auto-tours or trail systems.
- Maintain roads with scenic corridors and outstanding landscape features, and formally consider designating them as part of a "Discovery Route" or "Scenic Byway.
- Maintain roads provide access to Special Areas and historical sites.

Goal

Provide a diversity of trail recreation opportunities so people may experience a variety of environments and non-motorized travel and provide the greatest variety of Recreation Opportunity Spectrum (ROS) classes throughout the Forest.

Objectives

- Develop some trails and trailheads so that trail travel is a recreation experience in itself, instead of simply a means of accessing a particular area or attraction.
- Locate and develop trails for recreational purposes meeting and promoting the designated ROS experience for that Forest Management Area.
- Seek opportunities to convert some of existing roads to trails during watershed and project-level planning.

- Give priority to "road-to-trail" conversions that:
    - Access existing or planned trail systems, particularly those on the current Regional Capital Investment Schedule (e.g., Cape Mountain Horse Trail).
    - Are part of larger planning efforts involving private and public partnerships (e.g., "Corvallis-To-The-Sea Trail").
    - Reflect: 1) a demonstrated public demand/need for a specific type of trail travel in a particular area, or 2) a need to reduce user pressure and/or conflicts.
    - Best fit Forest and user requirements, and their desires for trail challenge level, development standards, scenic attributes, and recreation facilities.
    - Can serve administrative and other purposes (fisheries enhancement, fire protection etc.) in addition to recreation.
- • Modify the ROS of an area to reflect existing recreation opportunities as access within the Forest becomes limited.

D. Economics

People and communities who depend on Forest roads will be affected as access to many areas of the Forest becomes limited. Creative ways to reduce costs and maintain roads need to be developed.

Goal

Provide transportation systems and access in an economically efficient manner.

Objectives

- Prepare a cost/benefit analysis prior to each proposed project to help determine its value.
- Compare individual projects to Forest-wide, long-term transportation needs to ensure that they contribute to Forest goals.
- Develop innovative and efficient alternatives for transportation needs.
- Remain within funding constraints when planning and implementing transportation enhancement projects.
- Determine the full cost of each project alternative and use it as a decision criterion.

Goal

Consider the transportation needs of local communities and businesses which may depend on the Forest transportation system for their economic livelihood.

Objectives

- Ask communities in or adjacent to the Forest to provide information on their present or projected use of Forest roads.
- Consider their needs and preferences in planning future projects.
- Promote sound rural development.
- Develop partnerships or cooperative agreements where appropriate.

Goal

Share the construction and maintenance costs of Forest transportation systems with the primary users, whenever reasonably possible.

Objectives

- Evaluate existing road use to determine if partnerships or cooperative agreements are appropriate for road maintenance.
- Reduce cost to government through commensurate share agreements.

E. Implementation

Successful implementation of the Siuslaw National Forest A&TM Guide depends on many factors. The Siuslaw will implement the Guide by working cooperatively with regional and local governments, private businesses, and individuals. It will follow all applicable laws and Forest Service direction and policies, and use effective maintenance and management practices. Monitoring the effectiveness and impacts of the A&TM Guide will be ongoing, and changes to the Guide will reflect new or better information. Consistent application and enforcement of the A&TM Guide are also essential to its success.

F. Application and Review

Goal

Apply the A&TM Guide consistently throughout the Forest.

Objectives

- Use uniform signs, gates or other entrance management methods according to Regional "Standards for Forest Service Sins & Posters" and MUTCD standards as they apply to roads subject to Highway Safety Act and otherwise open to public travel.
- Produce district maps that are consistent with Forest-wide maps in appearance and objectives.

- Include the reason(s) for restrictions and closures on all signs identifying road or trail restriction or closure.
- Continually review implementation of the A&TM Guide. Incorporate road use changes, new technologies and innovative management practices in revisions of the A&TM Guide.

G. Maps, Brochures and Signs

Goal

Make current, accurate and easy-to-read information readily available to Forest visitors.

Objectives

- Produce a visitor map that highlights the **primary** and **secondary** travel routes and the Forest's access and travel management scheme with information on signs, restrictions, road and trail use policy, and all applicable addresses and phone numbers for further information.
- Provide a brochure between Forest Visitor Map revisions with information on sins, restrictions, road policy, and all applicable addresses and phone numbers.
- Continually update brochures to reflect changes in the road system, or to encourage changes in traffic patterns.
- Provide maps at low or no cost.
- Ensure that signs meet Regional and MUTCD standards and are maintained in good condition.

V. ACCESS & TRAVEL MANAGEMENT DECISION GUIDES AND PROCESS

A. Primary Roads & Selection Criteria

Primary roads will receive first priority for funds. These include Regional and subsequent Forest road maintenance allocations, Capital Investment Program funds, and forest highway emergency funds. Primary roads will be maintained at levels that safely accommodate low clearance vehicles (typically the passenger car).

Publics will be encouraged to use primary system roads for access into and through the Forest. **Except for some short primary roads that lead only to specific recreation sites,** these roads will coincide with the Regional Network, which will be shown on State highway and recreation maps.

Selection of Forest primary roads was based on the following criteria. The more criteria that apply to a single route, the greater its consideration as a primary road.

(1) Roads that link with state and county roads, which connect high-use entry points or population centers and provide major access into and through the forest.

(2) Among primary road alternatives, select the one that favors the greatest use of state and county road systems (these are usually double-lane roads and highways).

(3) Roads that help provide the most extensive linkage to secondary networks.

(4) Roads that are designated scenic routes or auto tours.

(5) Roads that provide access to recreation areas, which contain a number of developed sites and facilities.

B. Secondary Road Selection Criteria

This system is secondary to primary roads in overall resource access and traffic service levels. These routes make a direct single connection to management areas outside the reach of the primary system, and include the entire range of functional classifications (i.e. arterial, collector and local roads) and maintenance levels, from high-clearance vehicles to passenger car use. Some of these routes may resemble primary routes and function similarly but do not significantly meet primary road criteria. The secondary road system is fluid. Over the years, roads may come on and go off the system as determined by current needs and usage.

Selection of Forest secondary roads is based on the following criteria:

(1) Roads that give the best access to management areas outside the proximity of the primary network, considering that these areas or project sites cannot be accessed by short-term, temporary roads, or by means other than highway vehicles.

(2) Routes that extend primary forest roads as well as state and county roads, and give needed long-term access.

(3) Long-term roads with only periodic or seasonal restrictions.

(4) Roads that access developed sites, wilderness trailheads, multiple resource management areas, and special sites and facilities which require permanent vehicle access.

(5) A single road selection from alternative routes to the same area, site or destination that will generate the least amount of negative resource impacts (An example is selecting a ridge-top road over one within a riparian zone that meets the same destination access needs).

(6) Long-term roads that are supported by cooperative share-cost agreements or other partnerships and open to public travel.

C. Roads Other Than Primary or Secondary

Roads not selected for the primary or secondary system may remain in use under the following conditions:

1. Roads that are needed only for short-term or intermittent access (e.g., project access). This includes roads under special use or road use permit.
2. Roads requiring only seasonal closures for resource protection reasons.
3. Roads not on the Forest Development Road system (see glossary: “non-system travelway”) but are being maintained open by user(s) to private lands.
4. Roads maintained open through various forms of partnerships where partners agree to an equitable share of the maintenance.

All other roads that have no significant risk to safety or environment will be stabilized (see glossary). These roads should allow for high clearance vehicle use while in a closure cycle, that is in the time it takes to grow closed. Cross-ditches and waterbars should be the primary method of roadbed stabilization.

Roads that pose an immediate threat to resources may require a physical barrier to eliminate traffic or be 'obliterated (see glossary). Both road maintenance and obliteration plans will be based on resource protection needs identified in watershed analysis and the Forest Plan. These plans should prioritize roads to be closed, decommissioned, or considered for "roads-to-trails" opportunities as funds are available.

D. Entrance and Travel Management Strategy

Given the general category of a road, its planned maintenance level and the desired traffic management strategy, the acceptable entrance and travelway treatments can be determined. The traveler approaching the entrance to any road should, by the road's appearances and signage, be able to determine whether he or she will be able to safely travel it.

Tables 1 and 2 outline the Entrance and Travelway Management Strategy Guide.

Table 1

LOW-CLEARANCE VEHICLES

ENTRANCE AND TRAVELWAY MANAGEMENT STRATEGY GUIDE FOR ROADS INCLUDED UNDER HIGHWAY SAFETY ACT MAINTENANCE LEVELS 3-5

ROAD CATEGORY	TRAFFIC MANAGEMENT STRATEGY	MAINT. LEVEL	VISUAL APPEARANCE	SIGNING	ACCEPTABLE CLOSURE DEVICES: SIGN	GATE	EARTH MOUND	CAMOU-FLAGE	GUARD RAIL
PRIMARY	**ENCOURAGE** ALL HIGHWAY VEHICLES	3-5	BREAK EDGE STRIPING AT PAVED ROAD JUNCTIONS	STANDARD PRIMARY & SECONDARY ROUTE MARKERS DESTINATION/ DIRECTIONAL SIGNS	NO	N/A	NO	NO	NO
SECONDARY	**ACCEPT** HIGHWAY VEHICLES	3	BREAK EDGE STRIPING AT PAVED ROAD JUNCTION	SAME AS ABOVE BUT FEWER DESTINATION SIGNS	NO	N/A	NO	NO	NO
SECONDARY	**DISCOURAGE**	N/A	(GENERALLY NOT APPLICABLE TO LEVELS 3-5. MAY BE USED ON LEVEL 3 ROADS UNDER SPECIAL CONDITIONS--E.G., DURING HEAVY COMMERCIAL TRAFFIC.)		YES				
CLOSED	**PROHIBIT**	3-5	CLOSURE VISIBLE FROM ENTRANCE	STANDARD PRIMARY & SECONDARY ROUTE MARKERS	REG SIGN W/ CFR ORDER	INTER-MITTENT SEASONAL	NO	NO	TEMP
	ELIMINATE	N/A	(GENERALLY NOT APPLICABLE TO LEVELS 3-5)						

NOTE: Gates should be considered only when it is determined that no other method will work. Gates are generally acceptable for the following reasons:

1. Closure for a specific period of time, i.e., seasonal.
2. Closure supports resource objective, as in the case of wildlife habitat protection.
3. Closure is for health and safety reasons or emergencies (fire prevention, etc.).

Table 2

HIGH-CLEARANCE VEHICLE
ENTRANCE AND TRAVELWAY MANAGEMENT STRATEGY GUIDE
MAINTENANCE LEVELS 1-2

ROAD CATEGORY	TRAFFIC MANAGEMENT STRATEGY	MAINT. LEVEL	VISUAL APPEARANCE	SIGNING	ACCEPTABLE CLOSURE DEVICES: SIGN	GATE	EARTH MOUND	CAMOU-FLAGE	GUARD RAIL
SECONDARY	**ACCEPT** HIGH-CLEARANCE	2	"ROUGH" MINIMUM CLEARING WIDTHS	VERTICAL NUMBER POST	NO	NO	N/A	N/A	N/A
	DISCOURAGE ALL HIGHWAY VEHICLES	2	CROSS DITCHES LOW BERMS VEGETATION GROWING IN	VERTICAL NUMBER POST MAY HAVE ADVISORY OR WARNING SIGN	NO	NO	N/A	N/A	N/A
CLOSED	**PROHIBIT** YEAR-ROUND	2 / 1	PHYSICAL BARRIER	VERTICAL NUMBER POST	REG SIGN W/ CFR ORDER	PERIODIC SEASONAL	YES	N/A	TEMP
	ELIMINATE "STORM-PROOF" ROAD	1	PHYSICAL BARRIER ENTRANCE GROWN IN	VERTICAL NUMBER POST	NO	NO	YES	YES	TEMP

NOTE:

ACCEPT: Passenger cars are discouraged. Road better suited for use by pickups and other high-clearance vehicles. Vehicles with an under-carriage clearance greater than 6 inches are considered "high-clearance".

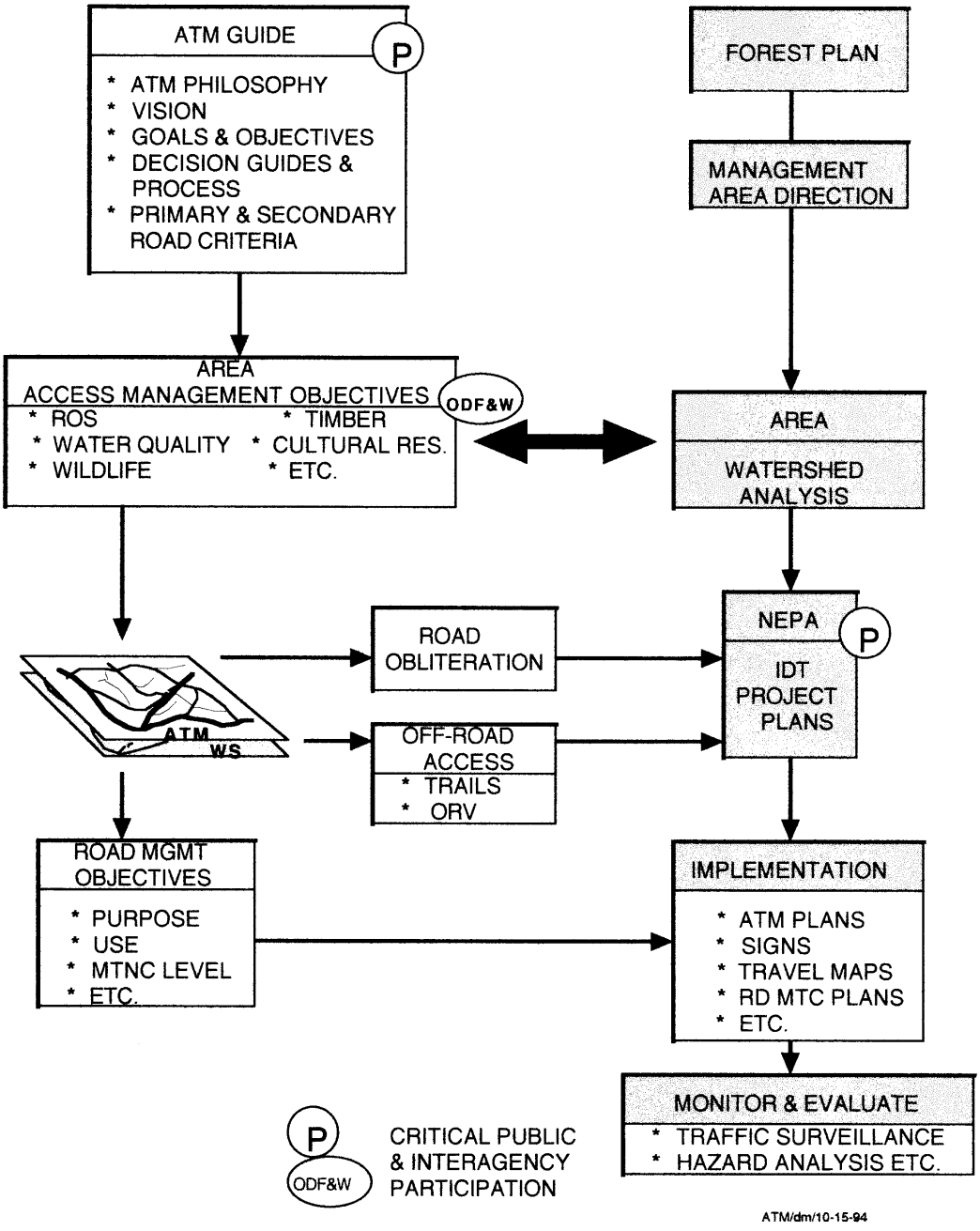
PROHIBIT: Regulatory sign posted. There should normally be a TRAVEL MANAGEMENT sign indicating road use restrictions and closure periods, restriction message, and acceptable uses. Reference EM-7100-15, Suppl R6-1, 9/92.
Use "eliminate" measures when enforcement is not feasible or intended.

ELIMINATE: Strategy is to permanently remove vehicle traffic without a prohibition (regulated closure) to other uses. Entrance will be barricaded or otherwise obscured from vehicle entrance. Maintenance level is 1, requiring road stabilization work prior to entrance closure.

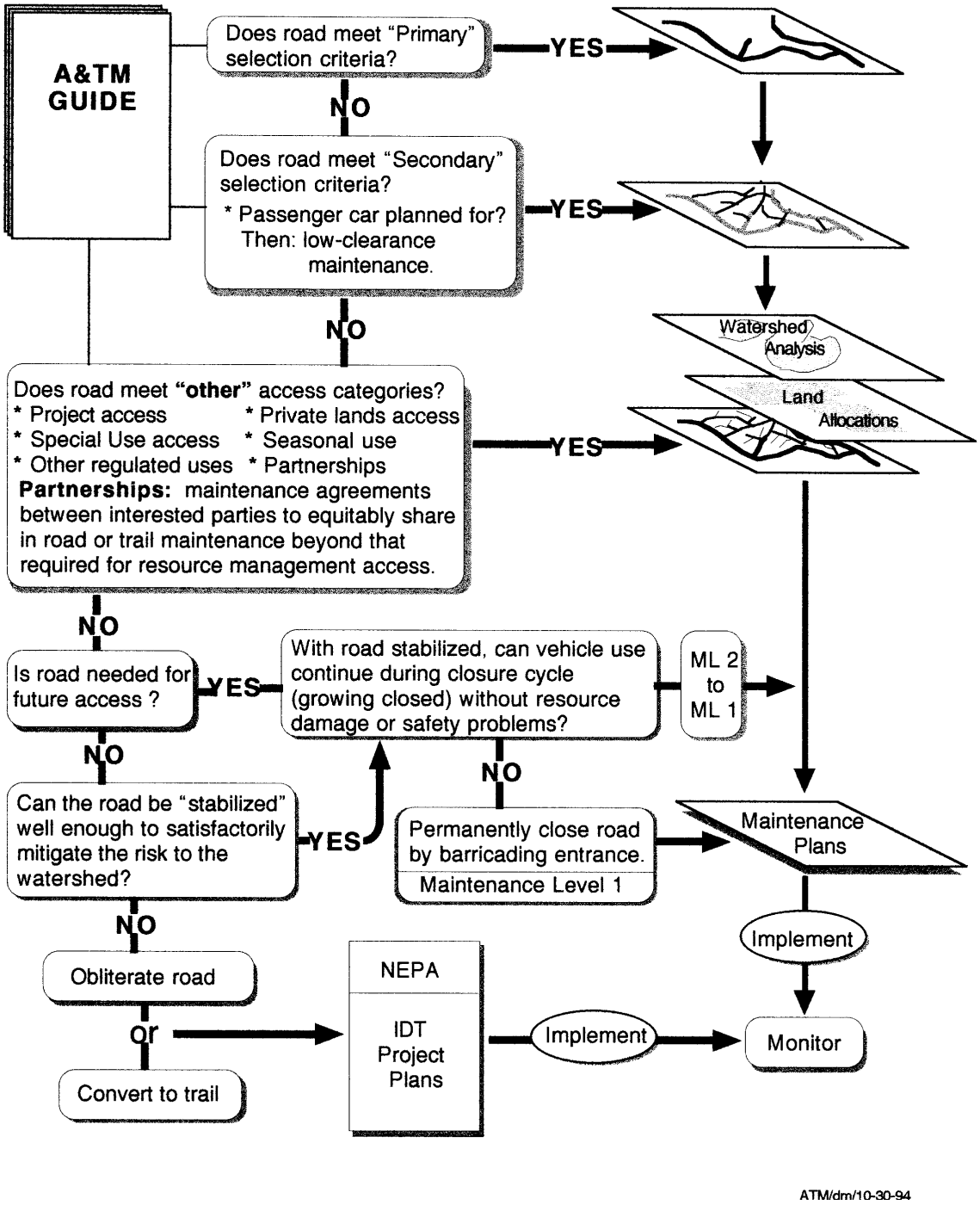
Road closure strategies are not to be confused with road elimination or "obliteration" (also called "decommission"). Roads closed still remain on the Forest Development Roads inventory in contrast to those Hydrologically obliterated. Roads obliterated should have entrances filled in, contoured and vegetated as much as practical.

ROUGH: This is indicated by a warning sign, or an irregular travelway.
Obstacles that might be encountered include rutting, potholes, slide and debris encroachments, and shallow drain dips.

ACCESS & TRAVEL MANAGEMENT GUIDE PROCESS



ROAD MANAGEMENT DECISION DIAGRAM
(AN IDT PROCESS)



VI. GLOSSARY OF TERMS AND ACRONYMS

*Ed. Note: Some of these definitions have been revised since 1994 (see **Glossary**, page 39).*

Access and Travel Management (A& TM) - A design and implementation of objectives, strategies, prescriptions, and operation plans for providing access and travel opportunities in the forest. It is not new idea or process. A&TM 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 A&TM Guide in conjunction with the Forest Land & Resource Management Plan as a guiding document. A&TM is dynamic, for it constantly responds to changing public, economic, land and resource management needs.

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.

Closed Travelway (Road) - A road on which traffic has been excluded by natural blockage, barricade, regulation, or by obscuring the entrance. A closed travelway is still an operating facility on which traffic has been removed (year-long or seasonal) and remains on the Forest Development transportation system. Closed travelways have two general categories: regulated use and restricted use.

Regulated Use (Gated Roads)

"Seasonally Open": 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.

Restricted 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.

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 'Regulated Use'.).

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 - (See 'Obliteration')

Developed Recreation - Recreation that requires facilities, resulting in concentrated use of an area. An example of a developed recreation site is a campground. 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.

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 Hebo, Waldport, Alsea, Mapleton and Oregon Dunes NRA.

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.

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 pubic travel and commerce.

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.

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

Forest Plan - The Siuslaw'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 Development Road - See 'Roads".

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.

Guideline - A policy statement that is not a mandatory requirement (as opposed to a standard, which is mandatory.)

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 forest 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 - 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 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.

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.

Maintenance Levels - Defines the level of service provided by, and maintenance required for, a specific road, consistent with road management objectives and maintenance criteria:

> Maintenance Level 1 - Assigned to intermittent service roads 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-laned 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.

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 o£ 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.

Obliterated Road - A road where the entrance is obscured and the wheel tracks or pathway is no longer continuous and suitable for travel. It includes travelways obliterated by natural processes such as revegetation and those for which the road

drainage is not in need of further attention. An obliterated travelway has been returned to the resource management purposes outlined for that area in the Siuslaw Forest Plan.

Obliteration (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. 'Obliteration! is not a road maintenance technique; it removes a road from the road system. Obliteration 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.

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.

President's 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.)

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.

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 facility 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:

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 Development Road - A forest road under the jurisdiction of the Forest Service (FSM 7705).

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).

Temporary Road - Roads associated with such uses as timber sale contracts, land and minerals needs or special use permits. These roads are not intended to be a part of the forest development transportation system and not necessary for future resource management (FSM 7705).

Non-System Travelway - 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.) This can also include trails.

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.

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

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

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.

Stormproofing - See Stabiilization.

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.

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

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.

Water Barring - 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 Restoration - Improving current conditions of watersheds to restore degraded fish habitat and provide long-term protection to aquatic and riparian resources.

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

REFERENCES

1. 'Land and Resource Management Plan - Siuslaw National Forest', 1990.

2. "Forest Ecosystem Management: An Ecological, Economic, and Social Assessment - Report of the Forest Ecosystem Management Assessment Team, July 1993" (FEMAT).

3. Record of Decision for Amendments to Forest Service and Bureau of Land Management Planning Documents Within the Range of the Northern Spotted Owl. Standards and Guidelines for Management of Habitat for Late-successional and Old-growth Forest Related Species Within the Range of the Northern Spotted - Owl, April, 1994.

4. '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", February, 1994.

5. "Travel Management - Bringing People and Places Together", National Access and Travel Management Conference Report, March 1992

6. "Access and Travel Management Guide (Minimum Requirements)", Regional guides to Forests, July 1992

7. 'Regional Access and Travel Management Activity Review', Region 6, June/October 1991

8. FSM 7700 - Transportation System WO Amendment 7700-92-2, 8/11/92

9. FSM, R-6 Suppl 7700-91-1, 5/28/91. 'Road restrictions information requirements and traffic management.'

10. FSH 7709.55, Transportation Handbook, 3/88, Process for Access Management

11. FSH 7709.58, Transportation System Maintenance Handbook, WO Amendment 7709.58-92-1, 9/4/92, Maintenance Level Descriptions, Maintenance Activities and Maintenance Standards, and Maintenance Sharing.

12. FSH 7709.59, Transportation Systems Operations Handbook, 7709.59-91-1, 3/1/91, Travel Management

13. FSH, R-6 Supp17109.13a, 2/16/93, Forest Visitor Maps content required

14. FSM, R-6 ID 7730-94-1, expires 2/8/96, Access and Travel Management, maintenance and funding

15. FSM, R6 Supp12600-90-2, 8/1/90, 2610.3 - Policy 2) "Recognizes State fish and wildlife ... with management responsibilities for wildlife on National Forests and includes them as partners in planning and implementation of activities that effect wildlife and fish."

16. Memorandum of Understanding, 85-06-63-15, USDA Forest Service and ODF&W

17. Supplement to Other Existing Master M.O.U. between Washington Dept. of Wildlife and the Oregon Department of fish and Wildlife (ODF&W) and the USDA-Forest Service, Region 6 (7/85) and USDI, BLM with attached: 'Managing Travel for Elk- Related Recreation' Interagency Technical Guidelines (First Edition), June 1991
18. FSM 1500, R-6 Suppl 1500-93-1, 11/22/93, "1535.13 - Memorandum of Understanding Relating to Forest Highways Over National Forest Lands. " Between Oregon Dept. of Transportation (ODOT) and USDA Forest Service.
19. 'Siuslaw National Forest Outdoor Recreation Mission Objectives, Management Direction and Action Items 1992"
20. 'Watershed Protection and Restoration in the Mid-Oregon Coast Range", Siuslaw National Forest, 8/18/93 revision
21. Design Guide For Accessible Outdoor Recreation", Interim Draft for Review, R-6, February 1992
22. "Standards for Forest Service Signs and Posters", EM-7700-15, Supplement R 6-1, September 1992

Correct: Exhibit 12-16 R6 9/92 to show "Road Restriction Sign" (11.4.4) as shown on pages 12-4 R-6 9/92, 12-7 R-6 9/92, and 11-17 R-6 9/92

Editor's Note:

Appendix 1 (ATM road network) from the 1994 Siuslaw ATM Guide is not included in this document. Updated Tables and Maps of the Key Forest Roads (formerly ATM roads) can be found in Appendix C.

APPENDIX 2 – ATM Guide

ATM Public Involvement Synopsis

June 1993 - June 1994

September 1992	Distributed a fact sheet and news release stating that the Siuslaw would have fewer roads for passenger cards.
June 1993	Acquired names for ATM mailing list by compiling district mailing lists & asking for other names of people or businesses who might have a Forest travel concern.
July, 1993	Sent letter and fact sheet regarding the ATM guide to mailing list. Packet included a response card and invited people to ATM workshops. Fact sheet included proposed criteria for primary & secondary roads and information on the ATM guide, saying that current budgets allow for maintenance of about 1000 miles of road.
July, 1993	Distributed news release explaining that the Forest was developing an ATM guide and asking for interested people to contact the district. New names were added to the mailing list. The news release also invited people to upcoming ATM workshops.
August 1993	Held three ATM workshops which detailed the primary road system and asked for input to determine criteria for the secondary road system. Also recorded general ATM concerns at these meetings. In total, about 70 people attended these workshops held in Corvallis, Florence and Lincoln City.
October, 1993	Compiled concerns heard from ATM workshops, letters, phone calls and response cards. Sent these concerns to ATM mailing list with a letter stating these are the concerns as we've heard them. Letter included a response form for people to express additional concerns.
October-January	During this time the ATM team considered public input, rewrote the secondary road criteria and worked with districts to propose a secondary road system.

ATM Public Involvement Synopsis (continued)

February, 1994	The Special Forest Products team identified roads as one of the main concerns of their publics. They sent out a mailing to all permit holders with a comment sheet. The ATM team received copies of all letters that addressed roads and included these people on the mailing list.
February, 1994	Fact sheet developed that outlined the new secondary road criteria and introduced watershed restoration, stating that information contained in the ATM guide will be considered during the watershed assessment process. The fact sheet was distributed informally through contacts.
March, 1994	Fact sheet developed. that spoke to-an ATM. map being developed. This fact sheet introduced a new concept: high and low clearance secondary roads. It also outlined the management tools that would be used for roads not on the primary or secondary systems. This fact sheet was distributed informally through contacts.
March, 1994	ATM Map developed. In addition, another reiteration of the fact sheet was developed that explained the map in more detail. It also spoke to future public involvement plans stating, "the proposed secondary system will be used as part of the information to be included in watershed analyses across the Forest. ... If watershed analysis identified a need to change the existing road system, additional public participation will occur."
March, 1994	Special forest products open houses occurred in Florence, Corvallis & Lincoln City. ATM was a part of these meetings, which reached about 30 people.
March, 1994	Developed a response to comments sheet that addressed all the major comments heard to this point.
April, 1994	Sent letter, ATM Map, response to comment document, new fact sheet & another comment form to entire ATM mailing list (about 360 people). Letter asked people to focus on specific road concerns.
April-May, 1994	Received comment forms back. Identified appropriate people to make contacts with key people on list and with everyone who returned the most recent comment form.
May-June, 1994	Phone calls made. Field tours occurred. Dan Mummey has also spoken to the following groups: Oregon Hunters Association, Siuslaw Timber Operators.

PUBLIC INPUT ACCESS & TRAVEL MANAGEMENT RESPONSES TO COMMENTS

During Summer and Fall of 1993, the Siuslaw National Forest asked interested people to comment on new direction for managing the Forest's road and trail systems. Comments came in the form of letters, phone calls, letters to the editor and participation in public meetings. In November, the Forest summarized all these comments, and sent them to all who expressed an interest, asking if this synopsis accurately represented the wide array of concerns.

The following is a response to those summarized concerns and others that have surfaced since the last formal communication with interested people. *(NOTE Because it is* difficult *to address every comment in this format, the following represents the most common comments. Many individual comments hove been addressed through personal letters and phone calls.)*

FIRE ACCESS

Concern: A reduced road system would impair fire protection efforts both on National Forest land and adjacent private lands.

Response: Since 1975, the Siuslaw National Forest has averaged 11 fires, burning about 35 acres a year. Humans caused about 95 percent of those fires, meaning that, on the Siuslaw, most fires occur in accessible areas. Therefore reduced access to the forest may reduce the number of fires. In addition, many roads that do not fall within the primary or secondary road system will have drivable ditches, called waterbars, making them accessible for fire fighting purposes. Other methods of fighting fires such as using airplanes and helicopters help ensure adequate access to Forest and private lands.

OTHER ACCESS

Concern: Having fewer roads will restrict access to private lands.

Response: The ATM guide recognizes the need to allow access to private lands. In most cases this will be done through partnerships or agreements with private landowners. Also Forest roads maintained for administrative purposes will provide access to some private lands. If you know of an instance where all access is blocked to private lands, please contact the Forest.

Concern: Less roads means shutting off access to certain groups like the disabled or elderly. These people will not be able to walk into areas like others will.

Response: The primary and secondary road system will continue to provide a variety of recreational experiences for Forest travelers including views along ridgetops and riversides. In addition, the Forest has about 20 recreation sites, including some trails, that have been specially designed for disabled access. Future recreational projects will continue to have a strong emphasis on accessibility.

ATM Responses---Page 2

Concern: Only elite groups that can afford other means of transportation like horses, bikes and trucks will be able to access the forest.

Response: The total primary and secondary road system equals about 700 miles. Including state and county roads, travelers have about 1400 miles of road to get them into and through the Forest, most of which are open to passenger cars. This should provide adequate access into the Forest for most people.

Concern: People must purchase permits to gather special forest products, but fewer roads will dose off access to areas where this gathering occurs.

Response: The Forest would like to form partnerships with people on a case by case basis who have specific access needs such as gathering special forest products. Please see the response under 'partnerships' for more information. The Forest envisions that road access will be identified in future special forest products permits.

Concern: Fewer roads will keep hunters from accessing certain areas. Other hunters support the idea of fewer roads to enhance the hunting experience.

Response: The primary and secondary road system under the ATM guide will provide a variety of hunting experiences. Although the guide doesn't guarantee that favorite hunting areas will be fully roaded, it does maintain access to large blocks of land. In addition, many roads will be stabilized, then may be allowed grow dosed naturally or remain open through use.

TRAILS

Concern: Many people would like to see roads converted into trails.

Response: According to the ATM guide, priority for "roads-to-trails" conversions will be given to:

- those that access existing or planned trail systems,
- those that are part of a larger planning effort involving private and public partnerships,
- those that reflect either a demonstrated public demand or need, or a need to reduce user pressure or conflicts,
- those that can serve administrative and other purposes in addition to recreation.

WATERBARS

Concern: Too many roads are being waterbarred. They're unnecessary, costly and make roads undrivable.

ATM Responses---Page 3

Response: The constant and heavy rainfall in the Coast Range means that some sort of maintenance -will have to occur on all roads to help prevent erosion and roads from washing out. For most roads that will not receive regular maintenance (roads off the primary and secondary systems), the Forest has decided to use waterbars. This ditch in the road essentially allows water to pass off the road, reducing sedimentation. The cost is minimal and waterbars can be easily filled if the road is placed on the secondary system. The Forest intends to build -waterbars so that trucks can drive safely over them.

OBLITERATION/CLOSING ROADS

Concern: "Obliterating" roads is costly. Some wanted to see the technique discontinued, others wanted to make sure that correct and effective methods be used.

Response: While the Forest plans to use obliteration as a tool, it is not the fate of all roads that don't make it on the primary or secondary system. Those roads that require major stabilization efforts to keep them from damaging other resources may be obliterated. In addition, the roadbed generally will not be completely removed. Instead the Forest will focus on "hydrologic obliteration", removing culverts and fills. Because road obliteration indicates a major change to the landscape, an environmental analysis will preface any decision to obliterate.

Concern: What do you mean by "closure?" What are the different levels of closure?

Response: See the enclosed tables, which explain the closure strategy.

WILDLIFE

Concern: Before making decisions on roads, the Forest should nn-, the potential of the wildlife resource and how roads affect that resource.

Response: The Forest will abide by all laws including the National Forest Management Act and the Endangered Species Act. In addition, the guide states that the Forest will consider wildlife habitat capability in all road management decisions.

ATM Responses---Page 4

PARTNERSHIPS

Concern: How can people form partnerships to maintain access on certain roads?

Response: The Forest would like to form partnerships with people who have access needs that aren't met through the primary and secondary systems. Before forming a partnership, the Forest would consider such points as whether the area actually requires vehicle access and how keeping the road on the secondary system affects Forest resource concerns. In addition, the Forest and partners would come to an agreement about how the road would be maintained and to -That level. If you're interested in forming a partnership, please contact the appropriate Ranger District.

INTERAGENCY COOPERATION

Concern: Make sure that maps between agencies (BLM, State, public utilities and counties) look the same.

Response: The Forest will, work with the BLM, State and counties concerning road decisions. Maps of the proposed secondary road system will be sent to each of these agencies.

RECREATION

Concern: **Recreation will concentrate around the primary road system.**

Response: Most recreation opportunities will be found off state and county roads (around 700 miles), primary roads (about 200 miles) and the secondary roads that are available to people who drive any sort of vehicle (about 150 miles).

SPECIFIC ROADS

Concern: Several people expressed interest in keeping certain roads open.

Response: Districts considered these concerns when making their first determinations about the secondary road system. Please look over the enclosed map; if you still have a concern about a specific road, please contact the appropriate district. Final determinations about roads will be made after receiving input about the enclosed secondary system.

ATM Responses---Page 5

EFFECTIVE MANAGEMENT

Concern: The Forest Service is losing an existing investment. People paid for the roads through taxes so they should be kept open.

Response: Timber harvesting was the primary purpose for creating the existing road system, most of which was paid for by timber receipts. Today very little timber harvesting is occurring on the Forest, which reduces the need for existing roads. The ATM guide examines the purpose for existing roads and will help the Forest make road management decisions.

Concern: Future maintenance costs should be a consideration.

Response: The Forest proposed the current system based on the long-term needs of roads (the next 10 years). If needed, roads can come off and go on to the secondary road system. If it appears that a road currently off the system will be needed in the future, the Forest can keep the road in a state that makes it cost effective to "re-enter when needed. Fully maintaining a mile of road over a 10-year period costs more than stabilizing it once.

Concern: Roads need to be managed in a way that complies with existing laws, plans and regulations.

Response: Forest road management will comply with all existing laws and regulations. The changes in the Siuslaw National Forest's road system are in response to increased understanding of sound stewardship of the resources, to comply with existing laws and regulations, and in response to changes in land management policies and plans.

Appendix C

Key Forest Road Tables and Maps

A more detailed map is contained in the Forest Atlas, which is available for review at the Siuslaw National Forest. Also filed with the Forest Atlas are:

- Individual district maps at the one-inch to one-mile scale (1:63,360).
- Identification of Key Forest Roads and non-Key Forest Roads.
- Road Management Objectives (RMO) of all classified roads.
- Forest recreation trails.

Key Forest Roads

Roads crossing county, congressional, or jurisdictional boundaries cause some duplication of road numbers in these tables. Other duplication indicates differing maintenance levels on segments of individual roads. For example, road 58 serves high clearance traffic traveling north and south through the Forest. Road 58 also has some low clearance segments, where east-west Key Forest roads use a segment of 58 in their route.

Primary Low Clearance

Road #	Name	Legal Description
1060775	Sutton Boat Ramp	
1060791		T17S R12W S26
1060792		T17S R12W S26
1060793		T17S R12W S34
1060794		T17S R12W S35
1060796		T17S R12W S35
1061000	WIN BAY South Beach	T22S R13W S23
1062000	South Jetty	T18S R12W S3
1062880	GOOSE PASTURE	T18S R12W S4
1068000	TYEE C.G.	T19S R12W S34
1070000	MTNCE. BLDG.	T19S R12W S33
1074000	LODGEPOLE C.G.	T19S R12W S33
1076000	LAGOON C.G.	T19S R12W S33
1078000	WAXMYRTLE C.G.	T19S R12W S33
1080000	DRIFTWOOD II III	T19S R12W S32
1082000	SILT. LOOKOUT	T20S R12W S4
1084000	CARTER WEST	T20S R12W S4
1086000	East Carter Boat Ramp	T20S R12W S8
1087000	O.D. OVERLOOK	T20S R12W S17
1089000	TAHK BOAT RAMP	T20S R12W S29
1089229	Tahkenitch Landing E.	T20S R12W S29
1090000	TAHK C.G.	T20S R12W S32
1091000	THREE MILE CR	T21S R12W S16
1092000	GARDINER	T21S R12W S22
1093000	EEL CR C.G.	T23S R12W S12
1095000	EEL CR WK CTR	T23S R12W S13
1097000	SPINREEL	T23S R12W S14
1098000	HORSFALL	T24S R12W S34
1098296	WILDMARE C.G.	T24S R13W S32
1099000	BLUEBILL	T24S R13W S32
1200000	HIACK ROAD	T5S R9W S33
1200000	HIACK ROAD	T6S R10W S9
1200000	HIACK ROAD	T6S R10W S15
1200000	HIACK ROAD	T6S R10W S21
1400000	MOUNT HEBO	T4S R8W S19
1861000	CASCADE HEAD	T6S R10W S7
2210000	CRAZY LAKES	T5S R9W S12
2234000	LITTLE HEBO	T5S R9W S36
2300000		T19S R9W S31
2300000		T19S R9W S17
2300000		T19S R10W S27
2400000		T18S R11W S36
2400000		T18S R11W S34
2400000		T19S R11W S5
2400000		T18S R10W S28
2600815		T18S R10W S11
2600822		T18S R9W S8
3000000	DICK'S RIDGE ROAD	T13S R7W S2
3000000	DICK'S RIDGE ROAD	T12S R7W S28
3000000	DICK'S RIDGE ROAD	T12S R8W S25
3010000	Mary's Peak Rd Lookout	T12S R7W S28
3100000	HILLTOP	T12S R9W S18
3100000	HILLTOP	TT12S R9W S8
3500000	NORTH PANTHER	T15S, R8W, S12
3515000	WILSON RIDGE	T15S R9W S25
3705000	YACHATS MTN.	T15S R10W S2
4800000		T19S R10W S16
4800000		T19S R10W S34
4800000		T20S R10W S5
4800000		T19S R10W S4
5400000		T15S R10W S8
5500000		T15S R12W S3
5553000		T15S R12W S2
5800000		T15S R10W S5
5900000	1000 LINE ROAD	T11S R10W S30
5900000	1000 LINE ROAD	T12S R10W S14
6300000	DEADWOOD	T15S R8W S19
7000715		T17S R10W S7
8533000	NIAGARA	T4S R8W S24
8533000	NIAGARA	T4S R8W S2
8533000	NIAGARA	T4S R8W S2

Secondary High Clearance

Road Number	Name	Legal Description
1004000	BUN CREEK	T3S R10W S30
1004000	BUN CREEK	T3S R10W S26
1034000	FARMER CREEK	T4S R10W S1
1034000	FARMER CREEK	T3S R10W S26
1045000	DICK'S FORK	T14S R12W S2
1045000	DICK'S FORK	T14S R12W S1
1046000	BLODGETT	T14S R11W S21
1055000	Fairview	T16S R12W S10
1057000	Coal Bank	T16S R12W S35
1059000	CAPE CREEK	T16S R12W S34
1059000	CAPE CREEK	T16S R11W S31
1106000	ANDY CREEK	T3S R10W S10
1201000	STILLWELL CREEK	T6S R9W S33
1280000	LEWIS CREEK	T6S R10W S9
1400000	MOUNT HEBO	T4S R9W S13
1400000	MOUNT HEBO	T4S R9W S19
1400000	MOUNT HEBO	T4S R8W S19
1400000	MOUNT HEBO	T4S R8W S19
1400000	MOUNT HEBO	T4S R8W S24
1410000		T4S R9W S21
1410000		T4S R9W S21
1410000		T4S R9W S21
1410000		T4S R9W S27
1428000	SOUTH LAKE	T4S R9W S30
1491000	CEDAR CREEK	T4S R9W S29
1500000	GAULDY	T4S R10W S24
1533000	CLEAR CREEK	T4S R10W S36
1633000	WEST FORK AUSTIN	T5S R10W S22
1726000	OSTERMAN CABIN	T7S R10W S3
1726000	OSTERMAN CABIN	
1726000	OSTERMAN CABIN	
1782000	BEAR RIDGE	T7S R10W S14
1861000	CASCADE HEAD	T6S R10W S15
1861000	CASCADE HEAD	T6S R10W S25
1861122	BEACH	T6S R11W S12
1861122	BEACH	T6S R11W S12
1861123	NORTH VIEW	T6S R11W S12
1900000		T7S R10W S36
1958000	PEA RIDGE	T8S R10W S13
1958112	PRUNE	T8S R10W S12
1980000	BEAR CAT	T8S R10W S14
2116000	MANN CREEK	T15S R10W S35
2127000	ELK CREEK TIE ROAD	T17S R10W S2
2214000	CRAZY BUCK	T5S R9W S14
2214000	CRAZY BUCK	T5S R9W S9
2280000	CONKLIN CREEK	T5S R9W S34
2480000	SUNSET ROAD	T18S R10W S31
2500000	RODGERS RIDGE	T17S R10W S11
2500000	RODGERS RIDGE	T16S R10W S33
2553000		T16S R10W S33
3119000	BULL RUN	T12S R9W S15
3210000	LAKE CREEK	T14S R9W S19
3225000	ALDER RIDGE	T15S R9W S7
3225000	ALDER RIDGE	T15S R9W S5
3250000	BOUNDARY ROAD	T16S R9W S5
3250000	BOUNDARY ROAD	T15S R10W S36
3259000	PANTHER	T16S R8W S18
3259000	PANTHER	T16S R9W S8
3259000	PANTHER	T16S R9W S12
3305000	DENZER RIDGE	T14S R9W S28
3305000	DENZER RIDGE	T14S R9W S32
3305000	DENZER RIDGE	T15S R9W S10
3305000	DENZER RIDGE	T15S R9W S10
3412000	MISSOURI TIE	T14S R9W S14
3412000	MISSOURI TIE	T14S R9W S13
3413000		T13S R9W S11
3420000	TRENHOLM SADDLE	T13S R9W S22
3420000	TRENHOLM SADDLE	T13S R9W S3
3420000	TRENHOLM SADDLE	T13S R9W S22
3446000	RISLEY	T13S R10W S31
3446000	RISLEY	T13S R10W S30
4100000	SMITH UMP	T21S R11W S26
4100000	SMITH UMP	T21S R11W S25
4100000	SMITH UMP	T21S R10W S19
4100000	SMITH UMP	T21S R10W S33
4100000	SMITH UMP	T21S R10W S2
4100000	SMITH UMP	T21S R11W S28
4811000		T20S R10W S21
4811000		T19S R10W S8
4811000		T20S R10W S6
4811000		T20S R11W S23
4811000		T20S R10W S24
4820000	PAXTON TIE	T19S R10W S20
4830000	POPO	T19S R10W S16
4830000	POPO	T19S R10W S17
4830000	POPO	T19S R11W S22

Road Number	Name	Legal Description
4880000	HADSELL	T18S R10W S13
4880000	HADSELL	T18S R9W S30
5100000	ELK HORN	T12S R10W S29
5100000	ELK HORN	T12S R11W S36
5200000	TIDEWATER	T13S R10W S24
5300000		T14S R11W S13
5300000		T14S R11W S13
5300000		T13S R11W S33
5300000		T14S R11W S5
5304000		T14S R11W S13
5360000		T14S R11W S5
5360000		T14S R11W S5
5360000		T14S R11W S16
5360000		T14S R11W S33
5500000		T15S R12W S2
5500000		T15S R11W S7
5500000		T15S R11W S22
5800000		T16S R11W S23
5800000		T16S R11W S26
5800000		T16S R11W S34
5800000		T17S R11W S3
5800000		T15S R10W S5
5800000		T15S R10W S8
5800000		T15S R10W S29
5800000		T15S R10W S30
5800000		T16S R10W S6
5800000		T16S R11W S13
5800000		T13S R10W S36
5800000		T14S R10W S15
5800668		T16S R11W S26
5840000	SMOOT	T16S R10W S6
5863000	WILHELM	T16S R11W S26
8170000	WILDCAT RIDGE	T3S R9W S17
8172000	BATTLE LAKE	T3S R9W S15
8172117		T3S R9W S10
8300000	CLARENCE CREEK	T3S R8W S2
8376000	SQUARE TOP	T3S R8W S35
8377000	GRINDSTONE VIEW	T3S R8W S23
8573000	BAY'S CREEK	T3S R9W S24
8593000	BOULDER CREEK	T3S R9W S35
8594000	BRIDGE RIDGE	T4S R8W S2
8594000	BRIDGE RIDGE	T4S R8W S2
8595000	FOLAND CREEK	T4S R9W S32
8598000	LIMESTONE	T4S R9W S32

Secondary Low Clearance

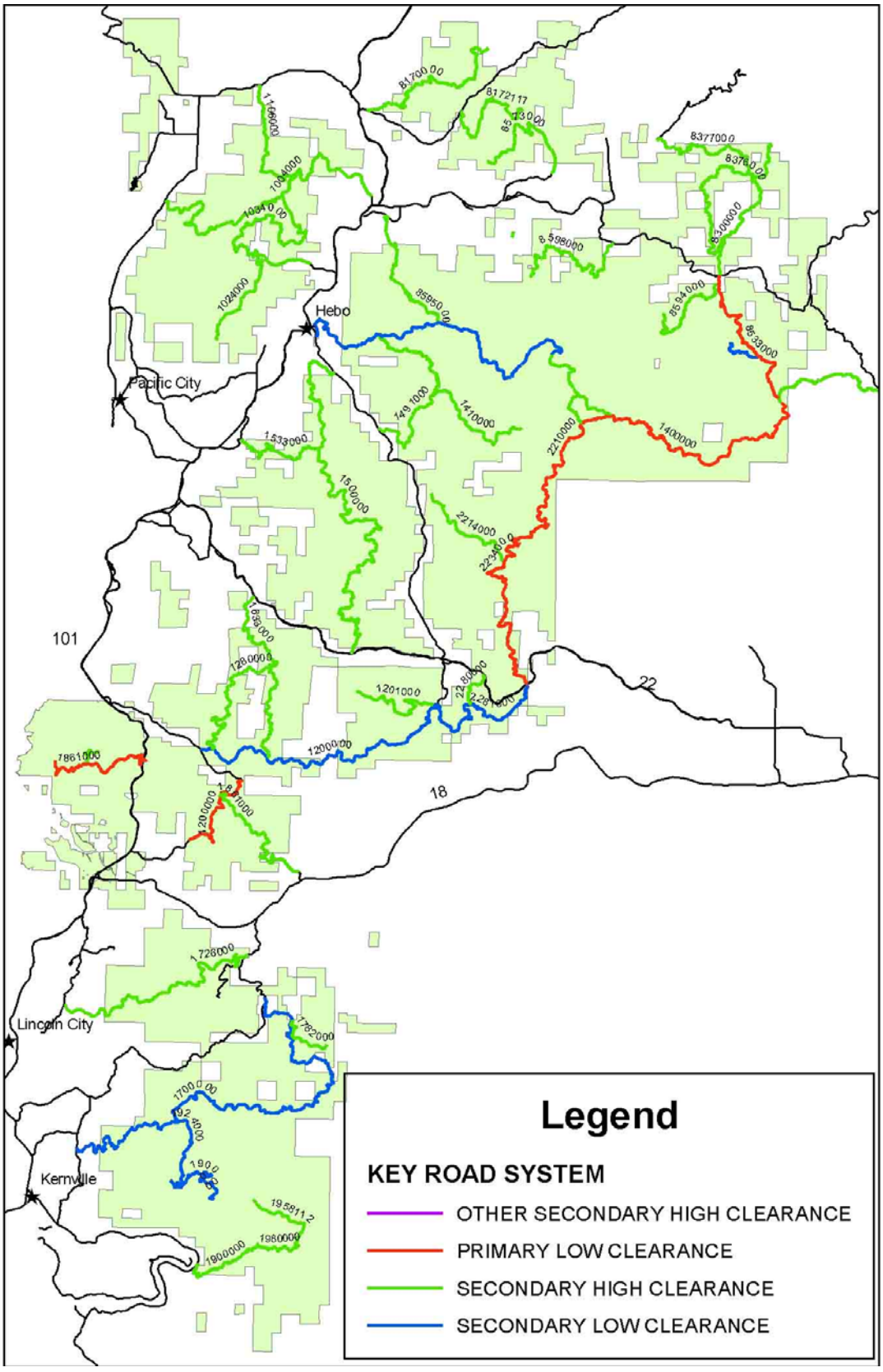
Road Number	Name	Legal Description
1046000	BLODGETT	T14S R12W S11
1046000	BLODGETT	T14S R12W S11
1046000	BLODGETT	T14S R12W S12
1050000	CUMMINS CREEK TRAILHEAD	T15S R12W S10
1051000	CUMMINS RIDGE	T15S R12W S15
1200000	HIACK ROAD	T5S R9W S33
1400000	MOUNT HEBO	T4S R9W S13
1400000	MOUNT HEBO	T4S R10W S14
1400000	MOUNT HEBO	T4S R9W S23
1400000	MOUNT HEBO	T4S R9W S23
1400000	MOUNT HEBO	T4S R9W S14
1700000	COUGAR MTN.	T7S R10W S11
1700000	COUGAR MTN.	T7S R10W S14
1900000		T7S R10W S36
1900000		T7S R10W S36
1900000		T7S R10W S36
1924000	COUGAR MOUNTAIN	T8S R10W S32
2281000	SOURGRASS RIDGE	T5S R9W S35
2281000	SOURGRASS RIDGE	T5S R9W S4
2300919		T19S R9W S14
2610000		T18S R10W S8
2619000		T17S R10W S5
3200000	INDIAN CREEK	T16S R9W S8
3200000	INDIAN CREEK	T16S R9W S20
3200000	INDIAN CREEK	T16S R9W S32
3200000	INDIAN CREEK	T15S R9W S27
3200000	INDIAN CREEK	T16S R9W S5
3278000		T16S R9W S20
3446000	RISLEY	T13S R10W S20
3446000	RISLEY	T13S R10W S22
3462000	CANAL CR.	T13S R10W S30
3505000	CAMP CREEK	T15S R9W S12
3505000	CAMP CREEK	T15S R9W S12
3505000	CAMP CREEK	T15S R9W S2
3505000	CAMP CREEK	T15S R9W S11
3505000	CAMP CREEK	T15S R9W S15
3505000	CAMP CREEK	T15S R9W S15
3505000	CAMP CREEK	T15S R9W S12
3700000	COUGAR RIDGE	T15S R10W S1
3700000	COUGAR RIDGE	T15S R10W S12

Road Number	Name	Legal Description
5000000		T12S R10W S21
5031000	HILLTOP	T12S R10W S17
5087000		T12S R10W S21
5100000	ELK HORN	T12S R11W S22
5200000	TIDEWATER	T13S R10W S36
5500000		T15S R11W S9
5590000		T15S R11W S2
5590000		T15S R11W S2
5600000		T15S R11W S35
5694000		T15S R11W S27
5694515		T15S R11W S27
5700000		T16S R11W S23
5800000		T17S R12W S12
5800000		T17S R12W S3
5800000		T15S R10W S32
5800000		T16S R10W S5
5800789		T17S R12W S14
5900000	1000 LINE ROAD	T12S R10W S24
8533120	NEW NIAGARA	T4S R8W S13
8533120	NEW NIAGARA	T4S R8W S13

Other – High Clearance

Road Number	Name	Legal Description
1000511	OCEAN BEACH	T16S R12W S10
1000514		T16S R12W S10
1000516		T15S R12W S3
1000519		T15S R12W S10
1000525		T16S R12W S34
1044000		T13S R12W S24
1046415		T14S R12W S2
1046416		T14S R12W S2
2005000	WOODS CREEK	T12S R7W S28
2005111		T12S R7W S11
2490000	HENDERSON	T19S R11W S2
2500000	RODGERS RIDGE	T17S R10W S11
2570000		T17S R10W S3
2610000		T17S R10W S30
3010000	MARYS PEAK ROAD-LOOKOUT	T12S R7W S21
3010112	WEST FORK SPUR	T12S R7W S19
3010114	MARYS PEAK CAMPGROUND	T12S R7W S20
3259618		T16S R9W S26
3400116	BLACKBERRY CAMPGROUND	T14S R9W S7
3400119	RIVEREDGE CAMPGROUND	T14S R9W S5
3405000	ROCK CREEK	T12S R6W S29
3406000	GRIFFITH RIDGE	T12S R7W S19
3408000	MILLER RIDGE	T12S R7W S13
3409000	EAST TRAIL	T12S R7W S13
3462419		T14S R10W S8
3462420		T14S R10W S8
3600816		T18S R10W S2
4800030		T20S R11W S34
4800831		T18S R10W S10
4800919	SWEETCREEK TRAILHEAD #2	T19S R10W S4
4890000	GOODWIN	T19S R10W S16
5200210		T12S R10W S36
5200212		T13S R9W S6
5562000		T15S R12W S3
5562200		T15S R12W S3
5694000		T15S R11W S27
5694000		T15S R12W S36
5694514		T15S R11W S27
5800530		T15S R10W S29
5800797	ENCHANTED VALLEY ROAD	T17S R10W S33
5860000		T14S R10W S8

Map 1 – Hebo Ranger District



Map 2 – Siuslaw South