# South Fork Alsea Watershed Analysis

**Bureau of Land Management Salem District**
**Marys Peak Resource Area**
**October, 1995**

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*The analysis portion of this project was done in Fall, 1994 and Winter, 1995. A first draft of this documentation was completed in Spring, 1995 but workload priorities prohibited the completion of this final document until now. No attempt has been made to update the information, process or format to correspond with the recently released federal guide for watershed analysis (Version. 2.2, August 95). This is a document which is still evolving and will be updated as new information becomes available. The data in this document was the best available; though in some cases there was little relevant data available. Management opportunities for this watershed must be considered in light of the checkerboard land ownership pattern of BLM-administered lands. Cooperative programs with adjacent ownerships are necessary to achieve optimum results in restoration opportunities for this watershed. No warranty is made as to the accuracy, reliability or completeness of the data or maps contained herein.*

# List of Tables and Figures

**Tables:**



**Figures:**

10 LWD Recruitment Potential for Fish-bearing Streams (For Private and BLM Lands).

11 LWD Recruitment Potential for Fish-bearing Streams (For BLM Lands Only).

12 LWD Recruitment Potential in Headwater Streams (For Private and BLM Lands).

13 LWD Recruitment Potential in Headwater Streams (For BLM Lands).

14 Age Class Distribution for BLM Lands.

15 Special Forest Products Permits Issued

16 Special Forest Product Revenues

# LIST OF APPENDICES

# EXECUTIVE SUMMARY

The South Fork Alsea watershed encompasses approximately 40,300 acres in the central Oregon Coast Range approximately 20 miles southwest of Corvallis. The geology of the watershed is composed of a mixture of volcanic and sedimentary rocks. It is highly dissected by intermittent and perennial streams which feed into the S. F. Alsea River. Streams in the upper portions of the watershed have higher gradients with steep, high ridges separating the streams. Lower portions of the river basin have broad, flat alluvial bottoms which were likely the focus of early settlement (both Native American and post-European) and, to this day, are the most populated portions of the watershed. They have a history of fishing, logging and agriculture.

The high precipitation and mild climate of this watershed provide ideal growing conditions for a wide variety of plants, creating one of the most productive timber zones in the world. Trees and shrubs are abundant, dense and fast growing.

The major factors affecting ecosystem dynamics within the S. F. Alsea watershed are large, infrequent, high intensity fires, high intensity winds, and storms that cause flooding and landslides.

As a result of fire history and past intensive timber management practices, the S. F. Alsea watershed currently provides very little habitat for those species which depend upon the following late-successional forest characteristics:

- large old trees with thick bark, large branches, and broken tops or decay pockets suitable for cavities

- a mixture of younger trees of a wide variety of ages, sizes, and species which add to multistory structure

- numerous large snags and decaying logs on the ground

Based on Landsat data, approximately 39 percent of the watershed is comprised of larger conifers (60 years and older); 19 percent is smaller conifers about 25-60 years old. About 24 percent of the forest is mature hardwoods-mixed and about 8 percent is young hardwoods-mixed. Open/bare ground classes comprise about 4 percent of the watershed. Only about four percent of the drainage is in old-growth condition (200 years and older). The majority of the mature forest habitat is fragmented except for a large block of mature forest on the north face of Prairie Mountain which provides some interior forest conditions.

Two federally threatened or endangered wildlife species (i.e., the northern spotted owl and marbled murrelet) are known or suspected to occur in the S.F. Alsea watershed. Both

species are strongly associated with late-successional forest habitat.

Terrestrial issues are focused around the concern for species which are closely associated with late-successional forest characteristics; specifically their long-term survival in a landscape which is dominated by early to mid-seral stands and the ways in which current stands will achieve the characteristics of older forests.

The Alsea River system is one of the most productive anadromous fisheries in Oregon. However, many of the anadromous salmonid fish stocks have declined. Many conditions have contributed to this decline, including conditions outside of this watershed or beyond the control of the Bureau of Land Management. This analysis concludes that the existing freshwater habitat conditions in this watershed are generally poor. This habitat is the most limiting factor for spawning and early smolt survival. Thus, fish populations cannot be restored without efforts to maintain and improve freshwater habitat conditions. These conditions are a result of natural events (fire and floods) and human interactions (agricultural and rural development, logging, grazing, and stream clean-out). Our analysis indicates that two key habitat features, large woody debris in the streams and high quality pools, are lacking throughout much of the watershed.

The anadromous fish problems are directly tied to the condition of the riparian zone. Some S. F. Alsea River riparian zones are dominated by red alder and young conifer trees. Alder decays so rapidly that it does not provide adequate large woody debris for stream structure; and young conifer stands must mature before they can provide adequate amounts of large woody debris. The analysis recommends placing a high priority on reestablishing conifers in the riparian zones for long-term, large woody debris recruitment. As these projects will not be effective until the trees grow to a large size and begin falling into the streams, the analysis also recommends conducting in-stream structural improvement projects, which have proven to be successful in this watershed. In-stream structural projects are short-term, "stop gap" measures intended to help the fisheries to survive and function until the riparian zones recover.

Sedimentation and stream temperature were identified as issues in this watershed; however, little data is available on the current or historic sediment loading or the effects of this sediment. The enclosed analysis characterizes the sediment sources in the watershed and identifies potential landslide areas.

Riparian Reserves comprise 66% of the BLM managed lands in this watershed. Overall they appear to be in good condition on an improving trend. A substantial amount (about 4400 acres) of our young, previously managed conifer stands are within the Riparian Reserve area and present an opportunity for management that should be further evaluated.

Only 178 acres of BLM timber is currently available for regeneration harvest within the watershed. Most of the watershed is in LSR or Riparian Reserve designations and most of the harvestable land in the GFMA area is in younger age classes. There are 714 acres of commercially thinnable land currently available.

The S.F. Alsea area is a major recreational use area and there is excellent potential, as well as a need for, further expanding the recreational use of the area. The best opportunities are in providing trails for hiking, horses and mountain biking near the current Alsea Falls campground, along the Backcountry Byway and connecting to Eugene District's Hult Reservoir.

The watershed has a well established and extensive road network that has been in use for quite some time. Though the roads are stable and very few pose problems; the lack of use and maintenance dollars, as well as the disruption of wildlife and potential for water quality problems, provides a large opportunity to reduce the amount of roads. The analysis found about 30 miles of BLM controlled roads are suitable for closure and another 50 miles of roads are suitable for gating and reduced maintenance.

Looking at land tenure objectives for the watershed revealed there are a few areas that would be beneficial from an ecosystem management perspective if we blocked up ownership. The areas include the Tobe Ck. and Rock CK. subwatersheds and the area of interior forest habitat on the north side of Prairie Mt.

This analysis identified issues and key questions, management opportunities which show promise of improving resource conditions while providing for some commodity outputs, data gaps that exist, and monitoring needs for the future. The following table summarizes these specific factors.

**Table 1. Management Summary for South Fork Alsea Watershed Analysis.**

| Issue/Key | Management Opportunities | Data Gaps | Monitoring Needs |
|---|---|---|---|
| **Soils:**<br>#1 - Mass Wasting | • Repair existing problems related to mass wasting potential.<br>• Implementation of BMPs. | • Lack of sediment yield estimates for debris avalanches and slumps. | • Measure quantity of slide material.<br>• Study existing deposits in riparian areas to determine causes.<br>• Monitor headwall areas with high mass failure and/or debris flow potential to provide an understanding of the processes linking the high gradient, eroding reaches with low gradient, depositional reaches. |
| **#2** - Hillslope Erosion | • Maintain ground cover on loamy soils on hillslopes with gradients greater than 60%.<br>• Maintain litter layer to protect clayey soils on same slopes. | • Lack of hillslope erosion studies. | • Placement of catchments to assess hillslope soil movement and comparison with controls and areas of varying cover condition. |
| **#3 -** Sedimentation From Roads | • Decommission all natural surface roads or resurface with gravel.<br>• Decommission all roads not intended for use during the next 10 years by gating or blocking.<br>• Protect stream crossings by use of a dip above the culvert or a berm to prevent runoff from reaching other culverts.<br>• Construct dips or outslope roads if distance between culverts is excessive.<br>• Decommission all roads by blocking, ripping and revegetation where roads are not scheduled for use during next 20 years; repair existing road-related problems; reduce road densities; minimize travel or maintain surfacing on roads used during rainy periods. | • Sediment yields from roads are poorly defined. | • Determine sediment yields from roads.<br>• Place sediment traps below known or predicted erosion areas and measure accumulated materials after a season.<br>• During peak flow periods, trace stream turbidity to determine its source. |

**Table 1. Management Summary for South Fork Alsea Watershed Analysis.**

| Issue/Key | Management Opportunities | Data Gaps | Monitoring Needs |
|---|---|---|---|
| **#4 -** Soil Productivity | • Recognize soil limitations and apply required practices to protect soil organic matter levels and soil porosity. | • Determine area of soil compaction on older harvest units.<br>• Lack of current research on relationship of soil compaction to runoff and sedimentation in streams.<br>• Need research on long-term impacts to growth of vegetation. | • Monitor subsoiling impacts to soil structure and runoff.<br>• Construct catchments in compacted, disturbed, and in control areas to measure the amount of sedimentation in runoff. |
| **#5 -** Sedimentation From Quarries | • Operate in quarries and haul only during non-rainy days.<br>• Direct all runoff in quarries before it reaches access roads. | • Lack of studies of sediment yields from quarry operations. | • Determine sediment movement during peak flow events.<br>• Establish the source of sediment and determine possible causes. |
| **Wildlife**<br>**#1** - Habitat Conditions | • Implement ROD (i.e., land use allocations designed to improve the amount and quality of older forests).<br>• Retain and enhance levels of coarse woody debris in commercial thinnings on GFMA lands.<br>• Commercial thinnings in LSRs should focus on improving the corridor of dispersal habitat in three subwatersheds (see Wildlife section). Consider forgoing thinning in 40-70 year old stands elsewhere in LSR.<br>• Road closures to benefit wildlife | • Lack of information on quality and quantity of special habitats within the watershed.<br>• Lack of basic inventory data for coarse woody debris on managed and unmanaged stands. | • Conduct monitoring in accordance with guidance presented in the 1994 Salem District RMP. |

**Table 1. Management Summary for South Fork Alsea Watershed Analysis.**

| Issue/Key | Management Opportunities | Data Gaps | Monitoring Needs |
|---|---|---|---|
| **Cont. #1 -** Habitat Conditions | • Focus precommercial thinnings adjacent to fragmented old-growth patches to lessen edge contrast.<br>• Block and decomission roads with priority to LSR and Riparian Reserves over GFMA. Within LSR, prioritize Tobe, Rock and upper Bummer Creek.<br>• Initiate inventory and field review process of special habitat features. | | |
| **#2 -** Wildlife Species | • Provide wetland habitats in Upper South Fork and Headwaters subwatersheds for northwestern pond turtles.<br>• Survey remaining old-growth patches for marbled murrelets.<br>• Initiate partnerships with ODFW and local landowners to benefit elk populations on federal lands and reduce damage complaints on private land.<br>• Initiate species assessments at the provincial scale | • Information on population size, distribution, and life history requirements.<br>• Lack of information on special habitats.<br>• Lack of large-scale and small-scale analyses of wildlife distributions and habitat. | • Survey and Manage requirements of the NFP and RMP will involve surveys for listed, candidate, and SEIS special attention species. |
| **Hydrology :**<br>**#1 -** Water Quality | • Conduct riparian enhancement projects to promote the growth of older conifers in riparian zones (high priority reaches include 4TOBE001, 4PEAK003, 4ROCK002A, 5PEAK900A&B, and 5PEAK001A-E).<br>• Treat motorcycle trails that are gully eroding. | • Water quality data is generally unavailable (i.e., temperature, chemistry; sediment; and biotic community).<br>• Flow data (i.e., base flow and peak flow).<br>• Effects of motorcycle trails on water quality (especially Peak Creek). | • Monitor following streams for stream temperature during summer base flow: Tobe Creek, Lower S. F. Alsea, Lower Bummer Creek, Peak Creek, and Rock Creek.<br>• Monitor turbidity for point sources of sediment in following locations: Peak Creek, Bummer Creek, tributaries to Lower and Middle S. F. Alsea, tributaries to Upper S.F. Alsea.<br>• Monitor macro invertebrate populations, dissolved oxygen, conductance and flow throughout the watershed in order to establish baselines for these parameters.<br>• Monitor motorcycle trails for compliance with trail standards. |

**Table 1. Management Summary for South Fork Alsea Watershed Analysis.**

| Issue/Key | Management Opportunities | Data Gaps | Monitoring Needs |
|---|---|---|---|
| **#2 -** Stream Function (Stream Channel Physical Variables) | • Enhance entire fifth order channel of Peak Creek.<br>• Rock Creek has low to moderate potential for channel structural improvement on reach 3ROCK008. | • Stream channel condition (i.e., large woody debris, pool/riffle ratio, gradient, etc.).<br>• Location and condition of wetlands. | • Establish monitoring program to determine long-term trends in LWD and other stream channel parameters.<br>• Conduct historical review of mass wasting activities and stream channel changes in S.F. Alsea using aerial photographs.<br>• Modeling of flow should be initiated. |
| **#3 -** Stream Function (Riparian Vegetation Condition) | • Conduct riparian enhancement projects to promote the growth of older conifers in riparian zones (high priority reaches include 4TOBE001, 4PEAK003, 4ROCK002A, 5PEAK900A&B, and 5PEAK001A-E). Additional opportunities exist along S.F. Alsea River. | • Improve LANDSAT characterization of riparian vegetation.<br>• Improve accuracy of hydrography and topographic themes. | • Stratify unsurveyed streams and proportionally sample to determine riparian vegetation condition.<br>• Survey portions of Rock Creek to serve as a reference stream or control for extrapolation and comparison to other coastal streams with similar geomorphology. |
| **Fisheries:**<br>**#1 -** Anadromous Fish Habitat and Populations | • Potential opportunity to expand habitat is limited to laddering natural falls on Tobe Ck., South Fork Alsea and Peak Ck.<br>• Pursue cooperative agreements with private landowners to improve anadromous fish habitat in Bummer Ck.., Peak Ck., Lower S. F. Alsea, and Middle S. F. Alsea subwatersheds through placement of instream structures. | • Limited current fish habitat data on public lands.<br>• Limited fish habitat data on private lands.<br>• Limited fish species distribution data.<br>• Limited trend data for fish abundance throughout the watershed. | • Continue fish escapement monitoring counts on Tobe Creek.<br>• Monitor fish enhancement project on Tobe Creek.<br>• Expand fish habitat monitoring to entire watershed. |
| **Riparian Reserves:** | • Complete stream surveys<br>• Determine appropriateness of interim Riparian Reserve widths.<br>• Evaluate density management (2500 acres) and thinning (1900 acres) opportunities to promote large tree development and to develop desirable vegetative structure. | • Knowledge of long term effects of thinnings on riparian habitat and ROD species. | • Monitor treatments for effectiveness<br>• Establish long term monitoring sites to determine health of riparian ecosystem subject to management actions. |

**Table 1. Management Summary for South Fork Alsea Watershed Analysis.**

| Issue/Key | Management Opportunities | Data Gaps | Monitoring Needs |
|---|---|---|---|
| **Timber:**<br><br>**#1 -** Timber Harvest Potential in GFMA | • Regenerate harvest suitable acres (633 identified acres of which 455 acres occur in Riparian Reserves).<br><br>• Promote a sustainable even flow of timber by focused amounts of harvesting in the future as younger age classes mature.<br><br>• Commercially thin suitable acres (2,592 identified acres of which about 1,900 acres occur in Riparian Reserves). | | |
| **#2 -** Density Management Opportunities in LSR | • Further evaluate single-story stands lacking structural diversity that were identified as potential areas for density management treatment (3,672 identified acres of which 2,658 acres occur in Riparian Reserves). | | |
| **Special Forest Products:**<br><br>**#1 -** Management of Special Forest Products | • SFP program should be sensitive to requirements of different land use allocations. | • Lack of research on responses of SFP species to harvesting. | • Monitor all SFP species to evaluate effects of harvesting. |
| **Roads:**<br><br>**#1 -** Current and Projected Use of Roads | • Develop transportation management plan to identify roads controlled by BLM that could be closed or gated to enhance resource values in the watershed. List of roads for potential closure is listed in Appendix 17. | | • Monitor road closures to determine effectiveness. |

**Table 1. Management Summary for South Fork Alsea Watershed Analysis.**

| Issue/Key | Management Opportunities | Data Gaps | Monitoring Needs |
|---|---|---|---|
| **#2 -** Road Condition Relative to Current and Projected Uses | • Develop transportation management plan to classify roads into "high, medium, or low" risk categories to indicate their potential for adversely affecting water quality. Restoration projects to mitigate resource damage will begin with "high-risk" roads. | • Lack of road/culvert data and condition on approximately 142 miles of private controlled roads.<br>• Limited drainage structure data on S. F. Alsea River Back Country Byway. | • Examine roads during and following major storm events to identify erosion problems associated with drainage structures, surface condition, and roadside slopes.<br>• Develop culvert risk rating/evaluation procedure to prioritize management opportunities. |
| **Recreation**<br>**#1 -** Disabled Access Needs | • Fund additional projects in the S.F. Alsea River Campground and Picnic Area that will provide recreational opportunities for the physically disadvantaged community. Include barrier free picnic units, improved facility access and a bridge for loop trail access to falls area. | • Need additional information on needs of the physically disadvantaged community. | • Monitoring standards to ensure the suitability of recreational projects to meet the needs of the physically disadvantaged community. |
| **#2 -** Potential Facility Locations and Factors Affecting Their Suitability. | • Establish S. F. Alsea River Trail and link the existing recreational facilities to Hult Reservoir in the Upper Lake Creek Special Recreation Management Area (SRMA).<br>• Enhance and designate an off-highway vehicle area at Greasy Creek/Crooked Creek area.<br>• Expand Alsea Falls campground.<br>• Plan and designate some road-to-mountain bike trail conversions in 14-7-35.<br>• Develop and improve recreational opportunities for nature activities including wetland and old-growth interpretive areas along the Back Country Byway.<br>• Develop Tobe Creek and Glenbrook roads as links between Salem and Eugene District recreation areas. | • Need data on road conditions and traffic routes<br>• Need information on user needs, frequency of use, number of riders, etc.<br>• Determine appropriate sites.<br>• Determine traffic patterns. | • Develop monitoring standards to assure the adequacy of recreational developments for public use. |

| Issue/Key | Management Opportunities | Data Gaps | Monitoring Needs |
|---|---|---|---|
| **Land Tenure** | • Block up lands to enhance development of interior older forest conditions; provide dispersal corridors for wildlife species; protect special habitats such as wetlands, grass balds, etc.; provide control watersheds completely under one ownership to evaluate future management actions in other watersheds; and provide recreational areas. | • Need additional information on land resource values for specific parcels of public and private lands. | • Assess desirability of land tenure adjustments and efficiency of the adjustment process at periodic intervals. |

# INTRODUCTION

## Purpose and Need

This watershed analysis presents our current understanding of the ecological processes and interactions occurring in the South Fork Alsea River ecosystem, referred to hereafter as the S. F. Alsea watershed. Watershed analysis is a mechanism to support broad ecosystem management objectives at the watershed scale as described in the Record of Decision for Amendments to Forest Service And Bureau of Land Management Planning Documents in the range of the Northern Spotted Owl (Northwest Forest Plan).

The analysis is intended to help us understand how land-use activities, the physical environment and the biological environment interact in the watershed. It is an information gathering and analytical process, not a decision-making process. It does, however, meet requirements under the National Environmental Planning Act (NEPA) for decision making in the future. The information will be used to identify restoration needs, data gaps and monitoring priorities, and help plan future land-use activities appropriate for the area.

Watershed analysis is a new and evolving science and is intended to be ongoing and iterative in nature. We recognize that additional data is needed for many of the resources, and further analysis of existing data may be needed to refine our perspective. As new data becomes available, the watershed analysis will be revised as needed.

**Objectives**

The following list served as the objectives for this analysis and were identified by the team through discussions with management, input from the public and by reading the Federal Agency Guide for Pilot Watershed Analysis.

- Describe the current condition of the key resources and processes at work in the S. F. Alsea watershed.
- Describe a desired future condition for key resources.
- Identify areas of concern within the ecosystem.
- Help identify and prioritize potential project areas for federal land managers.
- Identify data gaps that limit our analytical capability.
- Develop a monitoring plan to prioritize essential inventory needs and to measure change in the ecosystem over time.

- Develop a transportation management plan for BLM controlled roads in the watershed.
- Provide watershed level scientific information that will serve as a basis for site-specific environmental analyses.
- Provide basic resource information for identifying potential cooperative projects between federal, state and private land owners.
- Satisfy the requirements of the Forest Plan ROD that watershed analysis be completed prior to implementing certain activities.

# Process

The general process for conducting this watershed analysis was taken from the Federal Guide for Pilot Watershed Analysis Version. 1.2 which was released in January of 1994. Those steps were:

- Identify important issues in the watershed and use them to formulate key questions to guide the analysis.
- Identify the primary processes and functions that influence the resources at issue.
- Stratify the watershed to determine interactions of the various processes and their distribution and intensity.
- Collect data.
- Describe past and current conditions.
- Describe trends and predict effect of future land management
- Interpret information and present findings and recommendations
- Manage information, monitor and revise as needed

**Presentation of Findings**

The information is presented according to the following format. First we present a general description of the South Fork Alsea watershed analysis area including information on geography, climate, land management, vegetation, animals and social history. Next we discuss the issues and key questions that were used to focus the analysis. The issues have been grouped into three main topical areas: **Terrestrial**, **Aquatic** and **Social**. Each issue is presented under these topical headings as a series of key questions. The discussion for each key question, or group of key questions, is broken down into the following areas:

*Background* - This includes a description of the issue and gives background information to better understand the key questions. A background statement is not included for those key questions that are well understood.

*Present Condition* - This section simply describes the present condition of the affected resource including problems, concerns, and trends and displays useful data that best describes the resource condition using maps, charts and tables. To minimize the costs of production we have put most of the maps together in a packet at the back of the document.

*Desired Future Condition* - A brief discussion of what the future condition should be for each resource. This was focused mostly on BLM land and the assumption was that the Northwest Forest Plan and the Salem District Record of Decision and Resource Management Plan (ROD and RMP), dated May 1995, already describe a management scenario that dictates the desired future condition. The Northwest Forest Plan already describes a desired future condition for the major land use allocations of Late-Successional Reserves, Matrix or General Forest Management Areas (GFMA) and Riparian Reserves, and our ROD and RMP provides further definition of goals and objectives for key resources which serve well as a desired future condition. As a first iteration watershed analysis, the team felt it would not be possible to better define a future condition or to look farther into the future than these plans already have.

*Management Opportunities* - This is a listing of management opportunities or projects that the team felt are possible or should be done within the watershed. It includes restoration projects, habitat development, timber harvest, recreational development, road projects, etc. All of the management opportunities were summarized in table form in the Executive Summary.

*Data Gaps* - Where ever there was a lack of information that the team felt was important in doing the best analysis possible, we have listed it here. In general there was very little data available for private land. We pioneered the use of Landsat imagery to determine vegetation cover on private land and updated our private road and stream data with other data sources as well.

*Monitoring Needs* - Here we discuss the need to monitor resources to fill data gaps as well as to learn the responses to planned treatments, monitor the success of restoration projects, etc.

*Appendix* - To keep the main document from being filled with large lists and technical discussions, we have put species lists, analysis techniques, survey and other supporting data in

the appendix.

# Description of the S. F. Alsea Watershed

*Location:* The S. F. Alsea watershed is located in the central Oregon Coast Range (Coast Range

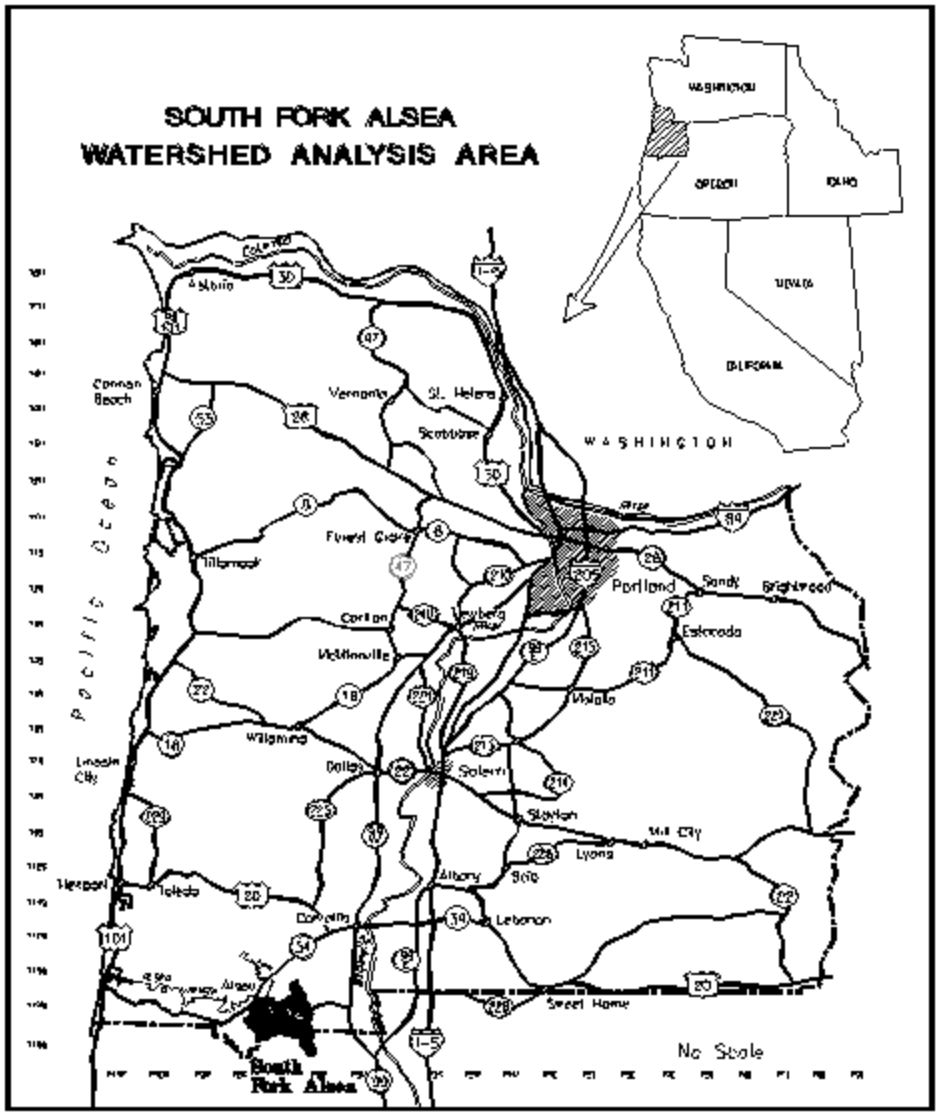


**Figure 1** Vicinity map of the South Fork Alsea Watershed

Province) approximately 20 miles southwest of Corvallis. It is a major tributary of the Alsea River, encompassing just over 40,300 acres (**Figure 1**).

*Geography:* The watershed area is roughly 10 miles wide from east to west and 6 miles from north to south. The South Fork joins the N. F. Alsea River just downstream from the town of Alsea. The joining of these two rivers forms the mainstem Alsea River that flows into Alsea Bay

at Waldport. The watershed includes about 429 miles of 1st to 6th order streams of which the Bureau of Land Management (BLM) manages approximately 180 miles of stream (*Table 2*). The S. F. Alsea River enters the southeastern corner of the watershed at approximately 1,300 feet elevation, and exits the watershed at approximately 300 feet, after traveling approximately 10 miles. Hult Pond is located near the headwaters of the S. F. Alsea River and is within two miles of the watershed boundary. To expedite analysis of watershed condition, the S. F. Alsea watershed was divided into eight subwatersheds. They include: Bummer Creek, Peak Creek, Tobe Creek, Rock Creek, Lower S.F. Alsea River, Middle S.F. Alsea River, Upper S.F. Alsea River, and S.F. Alsea River Headwaters (see ***Map 1*** in map packet).

The terrain is generally mountainous. From the south bank of the S. F. Alsea river, the terrain climbs to Prairie Mountain Ridge with four peaks over 3,200 feet. The eastern and northeastern boundaries of the watershed contain a number of dispersed mountains such as: Waters Mountain - 1,700 feet, McCloskey Knob - 1,870 feet, Green Peak - 2,717 feet, Flat Mountain - 2,600 feet, and Buck Peak - 2,717 feet above sea level.

**Table 2. Miles of Stream by Order and Ownership in the S. F. Alsea Watershed.**

| | Stream Order | | | | | | Ownership | |
|---|---|---|---|---|---|---|---|---|
| **Subwatershed** | 1st | 2nd | 3rd | 4th | 5th | 6th | Private | BLM |
| **Bummer Ck.** | 43.9 | 18.9 | 10.0 | 2.6 | 3.8 | 3.9 | 41.2 | 41.9 |
| **Lower SF Alsea** | 9.7 | 3.9 | 1.1 | 1.1 | 0.00 | 2.7 | 17.6 | 0.9 |
| **Middle SF Alsea** | 38.5 | 13.4 | 7.8 | 2.0 | 1.5 | 7.1 | 42.5 | 27.8 |
| **Peak Ck.** | 41.0 | 15.6 | 8.1 | 5.1 | 3.4 | 0.00 | 37 | 36.2 |
| **Rock Ck.** | 17.9 | 7.3 | 3.6 | 1.5 | 0.9 | 0.00 | 3.4 | 27.8 |
| **SF Alsea Headwaters** | 18.1 | 4.5 | 2.4 | 2.8 | 0.00 | 0.00 | 8.4 | 19.4 |
| **Tobe Ck.** | 14.9 | 4.8 | 0.8 | 3.8 | 0.1 | 0.00 | 0.9 | 23.5 |
| **Upper SF Alsea** | 53.8 | 22.8 | 11.0 | 5.3 | 3.5 | 2.0 | 28.1 | 70.3 |
| **Total** | 237.8 | 91.2 | 44.8 | 24.2 | 13.2 | 15.7 | 179.1 | 247.8 |

***Land Management:*** Approximately 95% of the watershed is in Benton County and the remainder is in Lane County. The BLM manages 23,000 acres (57%) within the watershed,

15,340 acres (38%) is owned by private industrial forest landowners, and the remaining 2028 acres (5%) is rural agriculture land with some residential properties (***Map 2***). The federal and private ownerships are well intermingled with a 10,000-acre block of consolidated BLM ownership on the north and east slopes of Prairie Mountain. This block is mostly mature forest and contains the headwaters for half the subwatersheds in the watershed.

The Northwest Forest Plan established two land use allocations for the federal lands (BLM only) in the S. F. Alsea watershed; Late-Successional Reserve (LSRs) and Matrix or General Forest Management Area (GFMA). ***Map 2*** displays these allocations. Approximately 15875 acres (69% of the BLM land) in the watershed is Late Successional Reserve and 7125 acres (31%) is GFMA.

***Climate***: The Alsea Basin has a marine-influenced climate, typical of the coastal area of Oregon. Winters are cool and wet and summers are warm and dry. Precipitation falls primarily as rain; average annual precipitation is displayed in **Figure 2**. In most years, at elevations above 1,500 feet, snow remains for short periods and is subject to rain on snow events. At this elevation, it is expected that precipitation intensities will exceed 5 inches in 24 hours every 2 years.

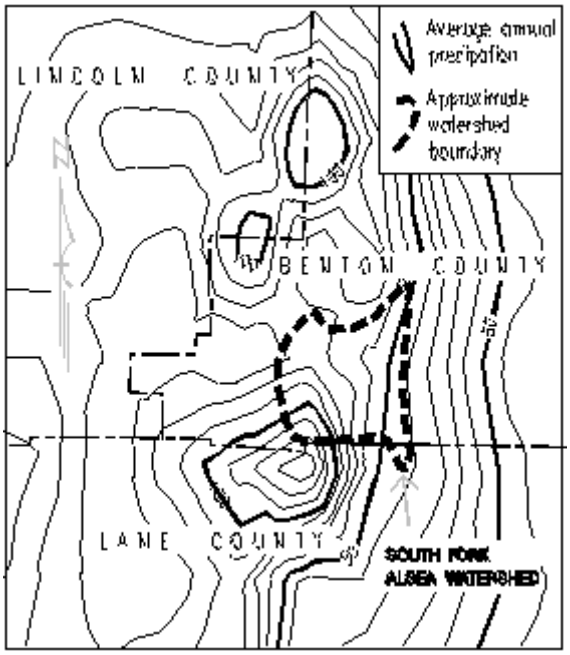


**Figure 2**. Normal annual precipitation in inches 1961-1990 (State Climatologist, Oregon State Climatic Service).

***Vegetation*** The S. F. Alsea watershed lies within the Western Hemlock Vegetation Zone, named for the "climax species" which eventually dominates the forested plant community. Douglas fir is currently the dominant tree species within the watershed, because it quickly regenerated after historic wildfires and because it is a long-lived species. Disturbances such as wildfires, windstorms, landslides, floods, insects, pathogens and human activity determine the successional pathways within the landscape. As a result of these disturbances, each plant community within the watershed has vegetation that occurs over a range of successional stages. Depending on the frequency or intensity of disturbance, there can be several successional pathways within a specific plant community. Repeated disturbance tends to maintain the early and mid-seral communities, and favor hardwoods. Immediately following large-scale disturbance, early seral stages predominate and late seral stages are deficient. As succession proceeds, early seral stages give rise to mid-seral stages; late seral stages develop slowly.

Timber harvest in the S. F. Alsea watershed began around the turn of the century; however, the

first significant timber management began in the 1950's and 1960's, when most of the old growth and mature timber was removed from the drainage. During this time, most of the old growth in riparian zones was also removed. Those lands which have been harvested are generally characterized by healthy and rapidly growing even-aged Douglas-fir stands. Alternative tree species in these stands, as well as snags, defective trees, and downed wood, are limited in extent.

Forest management activities and the associated roads have had a significant effect upon the character of the stands within the watershed and the ecosystem of the larger landscape. Forest harvesting has left a landscape largely made up of fragmented second growth conifers, some old growth and mature conifer, young conifer, shrub/grass-forb, hardwoods, and mixed stands in a variety of patch sizes. The spatial distribution of the various seral stages is not uniform throughout the watershed and is heavily dependent upon several factors including fire history and past management. Red alder and bigleaf maple often dominate along streams and rivers within the watershed.

There are no known threatened or endangered plant species within the S.F. Alsea watershed. *Appendix 1* lists the potential of occurrence for ROD lichen, moss, and fungi species.

***Animals*** The coastal coho and steelhead are currently being considered for federal listing as threatened species; both occur within the watershed. Federally listed threatened species known to occur within the watershed include: bald eagle, spotted owl, and marbled murrelet. Suitable habitat for all three species occurs within the watershed. Late successional species that were identified in the ROD for protection by "survey and manage" standards and guidelines are suspected to occur in the watershed. These include: red tree vole, silver-haired bat, long-eared myotis, fringed myotis, and long-legged myotis. Big game species of concern include Roosevelt elk and black bear.

***Social*** Residents are scattered within the watershed. Some private residences are located along the S. F. Alsea River National Backcountry Byway, but the majority of residents are grouped in the nearby communities of Monroe, Alpine, Bellfountain and Alsea. The majority of the private land within the watershed is managed for timber production.

The following discussion is a brief historical account of settlement in the S. F. Alsea watershed area with emphasis on activities that altered vegetation, habitat or waterflow. This knowledge helps understand the current condition of the watershed and how it developed to its present state.

Pre Euro-American Settlement: Limited information is available on pre-historic cultural activities in the S. F. Alsea watershed. There is physical evidence that shows people inhabited western Oregon at least as far back as 6000-8000 years B.P. (Minor et. al. 1980). There is less direct evidence for the S. F. Alsea watershed, however, so only inferences can be made as to how long the area has been used by native peoples. It is known that members of both the Alsea tribe and the Marys River band of the Kalapuya tribe inhabited the area periodically during their seasonal rounds. The construction style of the majority of the artifacts found in the watershed (primarily in and around the Alsea Valley), indicate that the Kalapuya people were the main inhabitants of the area, although artifacts from coastal tribes have also been found (Benton

County Museum).

The Kalapuya were primarily a Willamette Valley tribe. Since the Willamette Falls blocked most fish migrations into Willamette Valley streams, the Kalapuya did not have plentiful supplies of migrating salmon available. They may have seasonally utilized the Alsea River basin to supply additional fish protein needs.

The Alsea tribe, on the other hand, lived primarily along the coastal estuaries and thus had more plentiful supplies of fish protein. The Alsea Valley area may have been used for winter camps to avoid the harsh weather on the coast or in the Willamette Valley. It was supposed to be a favorite elk hunting area and undoubtedly served as a central meeting area for trading goods between tribes.

The extent of any deliberate burning done by native people in the watershed is not known. Burning in the Willamette Valley by the Kalapuya is well documented (Boyd 1986 and others). It seems reasonable to expect that some burning by these people may have been done in the South Fork Watershed as well. The condition of the valley areas around Alsea at the time of European-American settlement in 1852 was grass-oak savanna (Vol . 8 and 10 Kingfisher Mag.). In an undisturbed state, the soil and climate of this area would support a Douglas fir - bigleaf maple forest type. The grass-oak type found in the area at the time of settlement in the mid 1800's, suggests frequent, low intensity fire use, over long time periods by the native peoples.

Post Euro-American Settlement: Between 1850 and 1853, Congress, through various "homesteading laws" offered up to 320 acres to single men and 640 acres to married couples who settled in the Oregon country . In 1860 the Homestead Act was passed allowing the purchase of 160 acres of land at 25 cents per acre provided that the person settled on and worked the land at least 5 years (Cazier 1976, Muhn 1988, Munford 1982). The first homesteads were claimed in the watershed in 1852 (Munford 1982). Between 1854 and 1856, the government formed the Coast (Siletz) Indian Reservation and began moving the Indians off their land and on to the reservation. Beginning in 1856, some of this land was also homesteaded by settlers. The early homesteaders actively cleared the land including some heavily forested areas in an attempt to develop farms and graze livestock.

Transportation into the area in the 1860's was by a crude wagon road from the Willamette Valley to the town of Alsea, (the Alsea - Corvallis Wagon Road now State Highway 34). An 1853 survey map shows a trail from just south of Dawson to Alsea. By the 1880's the trail had been turned into a road. Sometime in the 1860's a road was also built from Monroe into the area on the South Fork of the Alsea River near the confluence with Williams Creek. The Inman saw mill was built there in 1868 that could cut twenty thousand board feet per day. By the 1870's a road had been built connecting Alsea with Lobster Valley. Most of the flatter lands in the Alsea Valley that were accessible by these roads were being farmed by this time.

Limited logging began at the time of settlement, the lumber destined for local use. By 1869 the Inman saw mill was shipping lumber to the Willamette Valley. In 1881 lumber was being transported from the Alsea area to Waldport in scows floated down the Alsea River.

Homesteading in the watershed continued up until the 1930's when Congress repealed the law. Except for land around the Alsea Valley, nearly all the land cleared for homesteading has reverted back to forest or is in the process of doing so at this time. A few cabins and remnants of old homesteads are still evident at various locations throughout the watershed.

A concrete dam about three feet high was constructed across the South Fork of the Alsea River just upstream from Tobe Creek in the late 1920's. The impounded water was used for irrigating farm land in the Alsea Valley. High water in 1972 washed out the bank on the south side of the dam. The dam was partially removed a few years later although broken sections of concrete can still be seen in the river at the old site.

# Key Questions By Resource

**Public Input**

Personal interviews were conducted with interested citizens knowledgeable of the South Fork Alsea Watershed. Interview forms were used to record this information (see *Appendix 2*). A summary of the key questions and concerns identified by the public is listed in *Appendix 3.* These issues and concerns were used in development of the Key Questions for each resource as described below.

**Terrestrial:**

1) How can forest management activities be applied to land in the watershed so that soil stability is maintained or improved?

2) How does hillslope erosion contribute sediments to streams and impact future productivity?

3) How can sediment from road surface flows be prevented from reaching streams?

4) How can soil productivity be maintained or improved through forest management activities?

5) How can sediment from gravel quarries be stopped from being transported from the quarry floor?

6) How should vegetation be managed in the S.F. Alsea watershed?

7) Are the present habitat conditions adequate to maintain wildlife species of concern ?

8) Will the current direction of federal land management plans provide for the needs of all wildlife species of concern ?

**Aquatic:**

1) How can we maintain or improve water quality in the S. F. Alsea watershed?

   a) What are the characteristics of streams in the basin relative to water quality standards set by the State of Oregon?

   b) Where do stream temperatures exceed State of Oregon standards for maintenance of aquatic biology, and how does this relate to riparian stand condition and forest management?

   c) Where do stream turbidities exceed State of Oregon standards? What are the characteristics of the natural sediment regime (delivery and routing) in the watershed? Where are the potential sources of accelerated sediment input to streams and how does this relate to water quality, aquatic biology, and forest management?

   d) Where are the stream channels and what are the limits of perennial, intermittent and ephemeral flow? What is the timing and delivery of high flow/flood events and how does this relate to watershed and stream conditions, and forest management: What is the characteristic base flow regime in the basin and how does this relate to watershed and stream conditions, and forest management?

2) How can we maintain or improve stream function in the S. F. Alsea watershed?

   a) Are stream channel physical variables (structure, gradient, substrate, sinuosity, width/depth ratio, etc.) in balance with the landscape setting (i.e., landform, geology, and climatic region)? What is the relationship between forest management and channel conditions?

   b) Are plant communities in the riparian area and adjacent uplands an adequate source of long term large wood recruitment to both the channel and flood plain? What is the relationship between forest management and the condition of the riparian vegetation?

3) What are the current conditions of the habitat of anadromous fish species and resident fish species compared with the desired future conditions within the watershed?

4) Is there evidence that fish habitat conditions have changed from historic conditions?

5) Where have management activities and natural processes reduced the large wood supply below natural levels?

6) What can be done to adequately protect and restore riparian areas?

7) What can be done to restore degraded/declining habitats of anadromous and resident fish species?

8) What are the management opportunities in Riparian Reserves?

**Social:**

1) What is the potential for timber harvest within the GFMA lands of the S. F. Alsea watershed?

2) Where do density management opportunities exist in the LSR lands of the S. F. Alsea watershed?

3) How should the Special Forest Products program be managed in light of the new allocations and management direction of the RMP and ROD?

4) What are the disabled access needs and opportunities?

5) Where are potential facility locations and what factors (e.g., road conditions, demand, use levels, capacity, accessability, type, etc.) affect the suitability of these sites?

6) What are the opportunities for land tenure adjustments?

# TERRESTRIAL

## ISSUE: SOILS

- ***Key Question: How can forest management activities be applied to land in the watershed so that soil stability is maintained or improved?***

**Background:**

Parent materials in the Oregon Coast Range are ocean floor sediments and basalt that were later intruded by diorite, syenite, and gabbro. This material was uplifted by the subduction of the Pacific Plate which resulted in dip slopes at various angles in the sediments and steep hillslopes in thick-bedded sandstone and igneous rock formations. A generalized geology map showing the distribution of sedimentary and igneous rocks in the basin is shown in Figure 3. Two kinds of

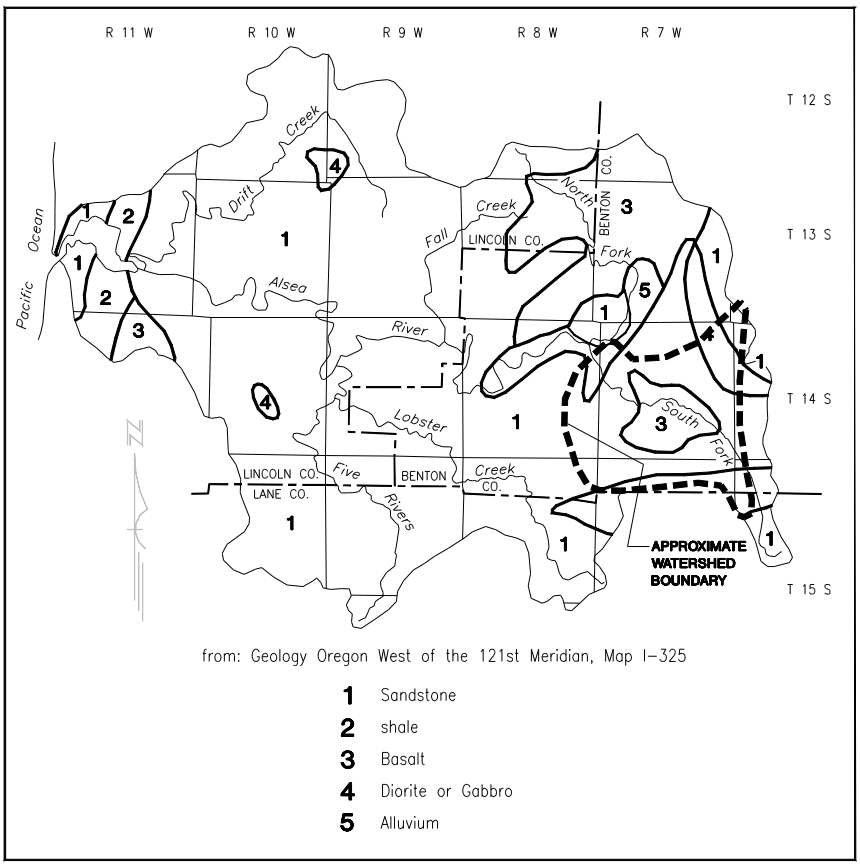


**Figure 3.** Generalized geology map for the Marys Peak Resource Area including the S. F. Alsea watershed.

sedimentary rock, shale and Arkose sandstone, are dominant. Arkose sandstone occurs in thick layers. The alluvium has mixed mineralogy because, in most places, it was derived from several kinds of parent materials.

Hillslopes on thick bedded sandstone and igneous formations are resistant to erosion and frequently steep. Natural erosion processes on steep slopes (>60%) are primarily mechanical where soil particles are detached from convex slopes and move down slope by gravity. When soil materials move into headwalls of drainages, they accumulate and become a source for debris avalanches during periods of high runoff or when support has been removed by construction or vegetation removal. Headwall failures typically occur at the maximum point of erosion. Mass wasting from head-wall failures is a major source of sediment to streams.

Typical soils and Land forms on volcanic parent materials and on thinly bedded sandstones are displayed in Figure 4. When soil materials move down slope into mid-slope concave positions they accumulate and over time become soil. These soils are usually deep, very gravelly, moist most of the year, and are the most productive portion of the hillslope. Soils on slides usually lack an A Horizon. An example of rotational landsliding and the typical orientation of trees following such slides is displayed in Figure 5.

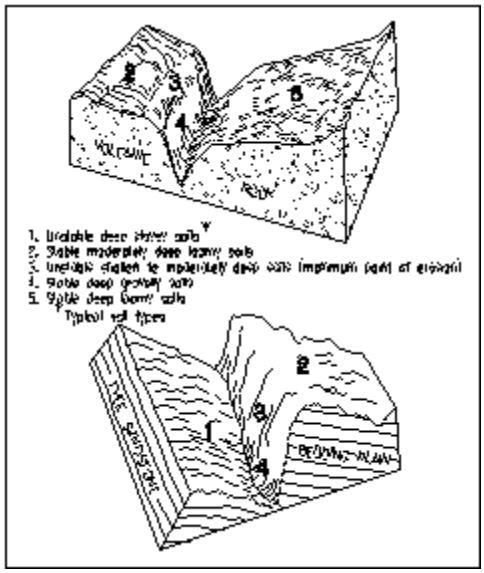

**Figure 4.** Typical soils and land forms on volcanic parent materials and on thinly bedded sandstones in the S. F. Alsea watershed.

Road construction has the potential of changing soil stability resulting in slope failures. Failures may result from plugged culverts and runoff diverted into fills during high precipitation events. Road locations that avoid scarps, toe slopes, and that do not disrupt natural drainage typically have a small impact on soil stability. However, changes in soil stability resulting from road construction are an important sediment source to streams and damage to downstream structures.

**Present Conditions:**

Generally, there have been few debris avalanches in the S. F. Alsea watershed and they occurred 30 to 40 years ago. Land forms near Alsea and the very eastern part of the watershed are composed of rolling hills with old stable surfaces containing fine textured soils with thick topsoils. Mass-wasting rates appear to be at natural levels or within expected rates. However, the watershed includes lands that are in various stages of soil creep. Natural drainage is disrupted by

soil creep resulting in slump-earthflows. Many of these slump-earthflows take several years to reach streams. The Salem Timber Production Capability Classification (Salem District RMP 1994), an evaluation of soil and land characteristics affecting timber production, contains some background data that pin points existing and potential instability.

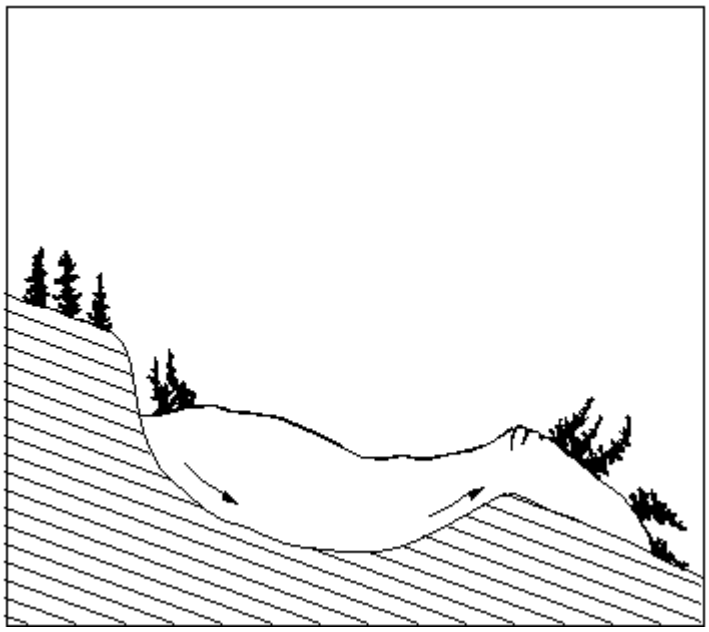

**Figure 5.** Example of rotational landsliding. Note typical orientation of trees.

***Map 3*** displays the landslide potential for the S. F. Alsea watershed. The high zones include areas of steep slopes where soil type and geology, coupled with evidence from past slides, indicates there is high potential for landslides. No direct quantification of sediment yield is intended from this map. There is a high potential for mass wasting in lower Tobe Creek drainage, the north slopes of Prairie Mountain, and Green Peak. Headwall failures occurred more than 15 years old in these areas, but they are probably no longer contributing sediments above natural forest levels. Lower Tobe Creek contains potential headwall failure areas, but those areas are timbered and have been removed from harvest by use of TPCC withdrawals.

There are a number of slides in the watershed that are road related, but none are known to be chronic sediment-producing slides. Some slides have been corrected by management intervention (e.g., along Roberts Road and the S. F. Alsea River road).

**Desired Future Conditions:**

Overall goal is to improve, restore and/or maintain soil productivity; comply with the Aquatic Conservation Strategy; and, comply with state water quality requirements to restore and maintain water quality to protect therecognized beneficial uses. Standards and guidelines established under the Salem District ROD and RMP to protect the watershed will be followed in order to meet the desired future conditions (see pp. 22 - 24, ROD).

**Management Opportunities:**

- Management opportunities exist to repair existing problems; *Appendix 17* lists road-associated problems where repairs would reduce the mass-wasting potential. The implementation of best management practices for road locations and fill design and maintenance will control surface runoff into unstable areas.

- The areas of high landslide potential should be targeted as areas to remove roads if possible and to use special precautions before constructing new roads and in designing timber harvest units. ***Map 3*** shows roads that occur in high risk areas that were further evaluated for potential closure or maintenance work due to their location in high risk landslide areas. See Road section and appendices 16 and 17 for more information on roads that have been proposed for maintenance or closure.

**Data Gaps:**

No sediment yield estimates are available for debris avalanches. Sediment yields from slumps are difficult to determine unless all materials are removed in the slide.

**Monitoring Needs:**

Measure the quantity of slide material. Attempt to locate deposits if in the riparian zone and attempt to determine cause for the deposits.

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- ***Key Question: How does hillslope erosion contribute sediments to streams and impact future productivity?***

**Background:**

Surface erosion of steep hillslopes is a natural erosion process that contributes sediments down slope. The natural erosion process is accelerated with the absence of vegetation such as occurs after timber harvest or other land clearing activities (road and building construction, agricultural field preparation).

**Present Conditions:**

The watershed contains soils that are subject to hillslope erosion. *Dry raveling* is active on slopes greater then 60 percent and is the most active surface erosion process in the watershed. High potential landslide areas (Map 3) contain convex slopes with gradients typically steeper then 60 percent and represent areas of potential dry raveling. Down slope movement of sediments has been measured up to 15 feet per year. Most of the sediments produced are sand and gravel. Since the erosion process is primarily mechanical, dry-raveling rates accelerate when vegetative cover is removed, and slow as vegetation and associated downed woody debris reclaims the site. Impacts to streams from dry-raveling is expected to be minor where stream adjacent slopes are vegetated or buffered.

*Overland flow* seldom occurs under natural conditions in the watershed. Most frequent events are at the maximum point of erosion on steep (>60%) hillslopes (Figure 4), the same zone where dry raveling and rain-on-frozen soil events occur. Sheet and rill erosion is influenced by soil compaction from timber harvest activities. The extent of disturbance, increase in soil density,

slope length, slope gradient, and vegetative cover are important factors to determine erosion potential. Mitigation by using a vegetative barrier or a diversion ditch can prevent sediments from leaving the site or reaching the stream. Hillslope erosion from overland flow is reduced by slash or vegetative buffers; therefore, little sediment is expected to reach streams with present restrictions.

Currently there are no major areas of accelerated erosion on hillslopes in the S. F. Alsea watershed.

**Desired Future Conditions:**

Overall goal is to improve, restore and/or maintain soil productivity; comply with the Aquatic Conservation Strategy; and, comply with state water quality requirements to restore and maintain water quality to protect the recognized beneficial uses. Standards and guidelines established under the Salem District ROD and RMP to protect the watershed will be followed in order to meet the desired future conditions (see pp. 22 - 24, ROD).

**Management Opportunities:**

Use Best Management Practices (BMP's) to maintain ground cover on loamy soils on hillslopes with gradients greater than 60%. Maintaining the litter layer will protect clayey soils on similar slopes. A listing of BMPs can be found on page C-1 in the ROD and RMP.

**Data Gaps:**

There are few hillslope erosion studies and those are short term. Hillslope erosion requires highly detailed studies. Although data would be desirable, the complexity of these studies makes it unlikely that data will be forthcoming.

**Monitoring Needs:**

- The placement of small barriers (6 to 12 inches) perpendicular to the slope with annual observation could be used to determine if there is soil movement. Establish control areas and sample various cover conditions.

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- ***Key Question: How can sediment from roads be prevented from reaching streams?***

**Background:**

Roads change the hillslope drainage process and through soil disturbance, contribute sediment to streams flows from road surfaces, cutslopes, fillslopes and ditches. Most critical portions of the hillslopes are mid-slopes where subsurface flows are intercepted by excavation of cutslopes.

Cutslopes of roads are frequently constructed at slope gradients steeper than 1:1 and are subject to dry raveling which is difficult to control. Roads function as surface flow paths and can channel appreciable volumes of runoff to streams. Surface runoff from roads can impact channel geometry of first-order streams. Because of road design, most of the runoff travels down road surfaces (especially in vehicle tire tracks) and into an outsloped or insloped point on the road, then usually directly into streams. Most of the roads in the watershed are insloped with ditches. Less runoff occurs in ditches, and unless there is flow in the ditch, little sediment in the ditch becomes available to streams. Sediments in this runoff can be severe when there is traffic during rainy periods, especially on dirt or poor quality rock-surfaced roads. This is a chronic sediment problem on heavily used roads.

Fillslope problems are usually associated with culverts and gullying. Cannon culverts without drop structures can cause gullying below the outlet. Gullying is commonly associated with: 1) flow quantity, 2) culverts placed on hillslopes with slope gradients >40%, and 3) soils of low cohesion. Sediment resulting from surface erosion of side-cast fillslopes, unless it is stream adjacent, can be controlled by a vegetative barrier.

Major road construction on BLM lands began in the 1960s, and BLM added numerous logging roads during the 70's and early 80's to support a timber harvest program. Most private industrial roads were constructed prior to the 1970s. Most of these roads were built to less stringent construction standards than exist today.

Roads on both federal and private timber lands have seen an evolution in construction standards. Prior to 1973 and the development of the Northwest Oregon Forest Practice Rules, there was not much concern about road placement. Road systems were often located next to waterways because the ground was flat and readily filled. In 1969, "best road location" became an objective. End-hauling, which is the hauling of excavation material to a site away from the road construction, was seldom practiced until the early 1970s. Instead, excavation material was pushed over the outer edge of the road (sidecast). In 1974, after the Forest Practice Rules came into effect, end-hauling was required by BLM, especially on head walls. Private and state of Oregon use sidecast road construction on slopes less than 50 percent when determined safe for water quality. Excavation is end-hauled on slopes greater than 50 percent. Federal agencies use sidecast road construction on slopes up to 45 percent unless conditions warrant otherwise. On less steep slopes, where construction material may reach a stream, sidecasting would not be allowed. Standards for culvert installation no longer permitted culverts which jutted out over the fill slope, locally called "shotgun" or "cannon" culverts, causing erosion problems when the plunging water hit the ground beneath it.

**Present Conditions:**

Currently the road density in the watershed is about 2.1 miles/sq. mile for BLM controlled roads on BLM administered lands and 3.2 m/sq. mile for private roads on private lands The average road density for all roads in the watershed is 5.2 miles/sq mile. Because of the moderate slopes in the watershed, road densities to meet forest management objectives are higher then in watersheds with steeper-sloping topography. Map 2 shows both BLM and private roads within

the watershed and gives an indication of road densities. Appendix 9 displays the total road densities by subwatershed.

An extensive survey of existing roads was conducted of all BLM controlled roads in this watershed in an attempt to determine road condition, erosion problems, culvert problems, usability and maintenance status. The condition of private roads was not assessed under this analysis. The problems were grouped as: 1) cutslope problems (17 sites) - mostly over steep cutslopes that were not vegetated and continue to erode, 2) fill slopes (7 sites) - fill slopes that have not revegetated and continue to erode, 3) ditches (8 sites) - long ditch runs that showed signs of eroding due to lack of vegetation or gravel, 4) gullies (4 sites) - usually at the end of a culvert, 5) blocked culverts (4 sites) and 6) roads without rocked surfaces (6.8 miles). This is considered a relatively minor number of problems and most of these can be corrected with regular road maintenance operations. The more extensive problem areas will need contracted maintenance or reconstruction.

**Desired Future Conditions:**

Overall goal is to improve, restore and/or maintain soil productivity; comply with the Aquatic Conservation Strategy; and, comply with state water quality requirements to restore and maintain water quality to protect therecognized beneficial uses. Standards and guidelines established under the Salem District ROD and RMP to protect the watershed will be followed in order to meet the desired future conditions (see pp. 22 - 24, and 62 - 64, ROD).

**Management Opportunities:**

- Decommission all natural surface roads (6.8 miles) or resurface with gravel.

- Decommission all roads not intended for use during the next 10 years by gating or blocking. Protect stream crossings by use of a dip above the culvert or a berm to prevent runoff from reaching other culverts. Construct dips or outslope road if the distance between culverts or where erosion is excessive.

- Decommission all roads by blocking, ripping and revegetation where roads are not scheduled for use during next 20 years.

- Repair all existing road-related problems discovered during road inventory as listed above.

- Repair County Road No. 47160. This road contains several miles of unsurfaced road. The portion of the road tributary to Peak Creek is a chronic erosion problem.

- Reduce road densities where possible.

- Minimize travel or maintain surfacing on roads used during rainy periods.

- Use mitigation measures to reduce road surface flows into first-order streams.

- Provide annual road maintenance on all high risk roads.

**Data Gaps:**

- Actual sediment yields from roads are not well defined or quantified. There are too many variables and long-term impacts to the watershed that are not well understood.

- Information from private controlled roads is not well known and the potential exists for more chronic erosion problems on private dirt roads.

**Monitoring Needs:**

- Determine sediment yields from roads.

  a) Place sediment traps below known or predicted erosion areas and measure accumulated materials after a season. Use only to predict future problem areas.

  b) During peak flow periods, trace stream turbidity from the bottom of the watershed to determine its source.

- Inventory private roads for erosion problems.

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- ***Key Question: How can soil productivity be maintained or improved through forest management activities?***

**Background:**

Forest Management activities can impact soil productivity through soil disturbance and compaction. Loss of soil productivity occurs primarily from the following activities: 1) soil displacement and compaction from ground-based yarding equipment, 2) scarification and site preparation, and 3) organic matter losses through soil displacement and slash burning. Most serious productivity losses from soil displacement and organic matter losses occur on shallow and moderately deep soils. Most serious productivity losses from compaction occur on the most productive lands.

**Present Conditions:**

Historically, much of the yarding done from 1940 to 1970 was ground based, without mitigation measures. While the impacts of soil displacement and compaction still exist, most sites have revegetated. Since 1970 improved forest harvest practices on both private and federal lands have greatly improved with the use of skyline logging systems, seasonal restrictions, designated skid roads and other practices. Currently, to minimize soil compaction and displacement, the BLM

requires one-end suspension of logs when logging during wet periods and total suspension over streams. The use of designated yarding roads and falling trees to lead is required for all ground-based yarding which minimizes the extent of compaction. Subsoiling is then recommended after all ground-based final harvests. The amount of post-harvest scarification has been reduced and new practices such as using excavator piling, 50% scarification standards and other BMPs has greatly reduced soil displacement as a productivity problem. Slash burning as a site prep tool has also been greatly restricted due to soil, wildlife, and smoke management concerns. When slash burning is necessary, BMPs, including slash burning when soil moisture is high (spring burning), aerial ignition, rapid mop-up and avoidance of steep hillslopes, are practiced where necessary to further reduce soil productivity impacts (*for complete list of current BMPs see RMP Appendix C-1*).

**Desired Future Conditions:**

Overall goal is to improve, restore and/or maintain soil productivity; comply with the Aquatic Conservation Strategy; and, comply with state water quality requirements to restore and maintain water quality to protect therecognized beneficial uses. Standards and guidelines established under the Salem District ROD and RMP to protect the watershed will be followed in order to meet the desired future conditions (see pp. 22 - 24, ROD).

**Management Opportunities:**

Management opportunities exist by recognizing soil limitations and applying required practices to protect soil organic matter levels and soil porosity. Use BMPs for all disturbance activities.

**Data Gaps:**

The area of soil compaction has not been determined on older harvest units. There is no current research that relates soil compaction to runoff and sedimentation in streams. There is little research on long-term impacts to growth of vegetation.

**Monitoring Needs:**

Monitor subsoiling impacts to soil structure and runoff. Construct micro-watersheds with catchments in compacted, disturbed areas, and in controls. Measure materials in catchments.

---

- ***Key Question: How can sediment from gravel quarries be stopped from being transported from the quarry floor?***

**Background:**

Quarries utilized to remove gravel for road surfacing are located primarily in areas of basalt and diorite (see Figure 3). Although quarries are small in size and frequently located away from streams, they can contribute sediments to road surfaces when there is activity during rainy

periods.

**Present Conditions:**

The BLM requires a quarry plan to allow for periods of operation and a sediment diversion to reduce sediments from entering road runoff. This plan also contains provisions for stockpiling and spreading soil, and revegetation after the quarry is no longer used. Most quarries operated in the SF Alsea watershed are privately owned and regulated by the state.

**Desired Future Conditions:**

Standards and guidelines established under the ROD and RMP to protect the watershed will be followed in order to meet the desired future conditions.

**Management Opportunities:**

Operate in quarries and haul only during non-rainy days. Direct all runoff in quarries before it reaches access road.

**Data Gaps:**

There are few studies of sediment yields from quarry operations.

**Monitoring Needs:**

Look for sediment movement during peak flow events. Establish source and determine possible causes. Work with other quarry owners to mitigate problems wherever possible.

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# ISSUE: VEGETATION

- ***Key Question: How should the vegetation be managed in the S.F. Alsea watershed?***

**Present Conditions:**

Plant associations have been identified for the Siuslaw National Forest for the western hemlock and Sitka spruce series (Hemstrom and Logan 1986). These associations also would apply for the S. F. Alsea watershed due to its proximity to the Siuslaw National Forest. The S. F. Alsea watershed is comprised of vegetation in the western hemlock series. Due to widespread, intense fire during the past 150 years, much of the western hemlock series is dominated by Douglas fir and red alder. A summary of the plant associations described for this watershed is in *Appendix 4*. This summary is based on work by Hemstrom and Logan (1986):

The seral age class distribution for BLM-administered lands in the S. F. Alsea River is shown in Map 4. This is based on BLM forest operations inventory data as distinct from gross vegetation classifications derived from satellite imagery data discussed below. Seral age classes are listed below:

| Seral Age Class Intervals | Acres |
|---|---|
| **0-20** | 4525 |
| **30-80** | 11372 |
| **90-190** | 4951 |
| **200+** | 1661 |
| **Total BLM forest acres** | 22509 |

Due to fires and timber harvest, approximately 7 percent of the BLM-administered land within the S. F. Alsea watershed is in the old-growth stage. This small percentage of old growth contrasts to an estimated 62 percent old growth in the pre-logging forests of the Pacific Northwest (Booth 1991). Less than 20 acres of existing old growth occurs on private lands within this watershed.

Using gross vegetation classifications derived from satellite imagery (Landsat TM 1988 imagery, interpreted by PNW), the majority of the S. F. Alsea watershed is currently dominated by conifer stands (Map 5). Closed conifer (large sawtimber) stands occupy about 39% of the land base followed by closed conifer (small sawtimber) at 19.1% (Table 3). Agricultural lands occur within the northwestern corner of the watershed primarily along the S. F. Alsea River. Along with open (grass/forb) and bare ground classifications, the open, bare ground and agricultural lands comprises about 5% of the watershed. Portions of the S. F. Alsea watershed

(about 32 percent) are dominated by red alder. Red alder invades after disturbance such as fire and forest harvesting. It has the ability to disseminate seed over large distances, grows rapidly on repeatedly disturbed forest land and can overtop conifer regeneration, resulting in nearly pure alder forest with dense shrubby understories of salmonberry. From the alder-dominated forest, the successional pattern moves to semi-permanent brush fields or to open stands of conifers, some of which germinate on rotting conifer logs. The gross vegetation classes are defined in the table below.

**Table 3. Acres of Gross Vegetation Classes within the S. F. Alsea Watershed.**

| Description | Acres | Percent |
|---|---|---|
| Bare Ground | 285 | 0.7 |
| Open (Grass/forb) | 1,491 | 3.7 |
| Open-Mixed (young hardwood dominant) | 3,180 | 7.9 |
| Closed-Mixed (mature hardwoods dominant) | 9,689 | 24.0 |
| Closed Conifer (young pole size) | 2,327 | 5.8 |
| Closed Conifer (small saw timber, 25-60 years old) | 7,673 | 19.0 |
| Closed Conifer (large saw timber, above 60 years) | 15,701 | 38.9 |
| Total Watershed | 40,349 | 100.0 |

Several special plant communities exist in the S. F. Alsea watershed including seasonal and permanent wetlands, wet and dry meadows, and shallow soil/rocky areas (Map 6). The extent of these habitats in the watershed is poorly understood and is based on the existing TPCC system (see soils section). A preliminary estimate of acreage for these special areas is: seasonal wetlands - 463 acres; permanent wetlands - 177 acres; wet and dry meadows - 7 acres; shallow soil/rocky areas (including oak/madrone woodlands) - 102 acres. Those plant communities associated with the lowest elevations in this watershed (oak/madrone woodlands and natural meadows) have been greatly diminished as a result of human settlement and agricultural use of the valley lowlands. Past fire regimes may have helped perpetuate oak woodlands and natural meadows by removing competing vegetation. The recent exclusion of wild fire (1950s to present) due to more intensive and effective fire restriction measures has likely increased the shrub component

of natural meadows, and has increased the conifer component of the oak stands.

***Fire History:*** The Coast Range is characterized by a pattern of large scale (some greater than 20,000 acres), infrequent (150-300+ year mean fire return interval), stand replacement fires typical of cool moist climates where lightning is uncommon (Agee 1990; Teensma 1991). Historically, large patches of similar seral stages covered much of the Coast Range. Both natural and human disturbances have created smaller scale patches of seral diversity.

Beginning with the immigration of settlers to Oregon in the mid-1800's, fire in its natural role, has been systematically reduced in the forest. With settlement also came logging. These two factors have affected the overall species and age distribution of the present day forests.

In the S. F. Alsea watershed, (excluding areas logged), the existing forest stands reflect past (natural) fire activity as well as the more recent fire exclusion. During the period between 1846 and 1853, at least two large wild fires collectively burned through approximately 1,280,000 acres of the central Coast Range. One fire, or more likely a series of fires, burned approximately 800,000 acres of the central Coast Range between the Siuslaw and Siletz Rivers and has been referred to as the Siletz Fire. Another large burn called the Yaquina Fire, burned 480,000 acres in the area between near present day Corvallis to Yaquina Bay (Gannett 1902; Walstad 1990; Teensma 1991). Historical accounts of these fires conflict somewhat but the sum knowledge indicates that at least two or three very large fires occurred sometime between 1846 and 1853. During this period it is likely that new starts or holdover fire from the previous year broke out anew in the summer and burned additional acreage, the net effect being that over a million acres of forest in the central Coast Range was burned during the period (Walcon 1902, Walstad et al. 1990). Most of the S. F. Alsea watershed area was included in the Yaquina fire area.

The large tracts of even-aged forests in the western two-thirds of the watershed are current evidence of these past catastrophic events. The age of most of the stands in the northwest two-thirds of the watershed suggest establishment around 1860 to 1890 with the majority of the stands dating from 1880. The apparent 15 to 35 year delay in forest reestablishment is owing probably to the difficulty of reseeding large areas devoid of a seed source following an intense fire. A general observation from a 1902 USGS report describing this general area states, "Areas are reported which were burned twenty-five to fifty years ago on which there is no vegetation larger than brush and ferns, trees of any species not yet having obtained a foothold" (Gannett 1902). In some cases, delayed forest re-establishment is the result of livestock grazing and springtime burning for pasturage. During the late 1800's until the 1940's, portions of the watershed were used for livestock grazing. Periodic burning to maintain grass and forbs in areas of the old burn was a common practice among homesteaders (interviews - local residents). Some of these "fern openings" are still evident today. Abandonment of open grazing and reforestation efforts by land owners since the 1960's has hastened the return of much of this land to a forested condition.

The forests in the southeast one-third of the watershed are more variable. Here there are distinct, relatively even-age stands as well as stands that are composed of a mixture of age classes

characteristic of late seral stands. Excluding logged or homesteaded areas, the youngest stands date from around 1850-60 which coincides with the period of the Yaquina fire. There is another age class of trees dating from 1800. A third less distinct age group is a scattering of individual trees and occasional small stands of trees older than 225-250 years.

Many of the older trees in this portion of the watershed have charred bark. It is probable that this area was exposed to more frequent less intense fires due to its closer proximity to the Coast Range summit and the Willamette Valley. Historical accounts and evidence of frequent seasonal burning in the Willamette Valley and valley margins, by the Kalapuya Indians, is well documented (Agee 1993; Beckham 1978; Boyd 1986; Zybach 1988). Periodically, when the fuel and weather conditions were favorable to burning, it is likely that some of these valley fires burned up to and over the summit then down into the eastern portions of the S. F. Alsea watershed. Our present day experience with fire in this region, shows that in all but the most extreme conditions, many of the larger trees will survive a fire. This is particularly true if the amount of surface and ladder fuels are at a reduced level. This would be the case where more frequent fires are the norm (Agee 1993; Walstad 1990). A regime of more frequent anthropogenic caused low and moderate intensity fires may provide a possible explanation for the distinct differences in stand age and composition found in the eastern one-third of the watershed. The scattering of 1850-1860 timber types within this portion of the watershed suggests that the Yaquina fire did burn through at least some of the area though mostly at a less than stand replacement intensity.

Fire adaptations in the predominant overstory and understory vegetation of the S. F. Alsea watershed are evident and provide further evidence that this is a fire dependent ecosystem. Thick bark, ability to sprout, deep roots, adventitious buds and lignotubers are all examples of adaptations plants use to survive or regenerate themselves following a fire (Agee 1993). On the other hand less fire tolerant species such as Western red cedar and Western hemlock have thin bark, shallow roots, and lack the ability to sprout. In the S. F. Alsea watershed, the less fire tolerant vegetation is much less common and will generally be found in cooler, wetter microclimates around streams, on north aspects or as a younger-aged understory component of the Douglas fir stands.

That fire has been a factor in the development of the "natural" forests in the S. F. Alsea watershed is well established. To what extent fire is needed in sustaining this ecosystem is not clear. The vegetation tells us that this is a fire dependent community. If we are to maintain it within it's "historic or natural range of variability" introduction of fire at some point will be necessary. Further study is needed before we can confidently determine what this range of variability is and when and how much fire is necessary to maintain the ecosystem within this range.

***Threatened, Endangered, and Sensitive Plant Species:*** No threatened or endangered species are presently known to occur within the S. F. Alsea watershed. The loose-flowered blue grass (*Poa laxiflora*), a BLM sensitive species (Tracking), is known to occur at a few sites in the watershed. The Oregon Coast Range represents the center of distribution for this species and contains the majority of known sites. Threats to this species are now minimized on federal lands

due to reduced clearcutting of forests.

***Noxious Weeds:*** Certain invasive plant species, listed as Noxious Weeds by the Oregon Department of Agriculture (1994) are known to occur in the S. F. Alsea watershed. These include: Canada thistle (*Cirsium arvense*), bull thistle (*Cirsium vulgare*), Scotch broom (*Cytisus scoparius*), St. John's wort (*Hypericum perforatum*), and tansy ragwort (*Senecio jacobaea*).

Canada and bull thistles, St. John's wort and Scotch broom are well established and widespread throughout the Marys Peak Resource Area as well as the Salem district. Eradication is not practical using any proposed treatment methods. However, treatment emphasis will be biological control agents. Populations of tansy ragwort have been partially contained as a result of biological control efforts. Populations primarily occur in disturbed areas, such as roads and landings.

***Species in the Record of Decision:*** Appendix 1 lists the likelihood of occurrence for Northwest Forest Plan ROD species within the S. F. Alsea watershed. These species are to be protected by the application of survey and manage procedures, as designated in the Northwest Forest Plan. A complete understanding of the current condition is unavailable for many of these species, particularly the non-vascular plants (fungi, lichens and bryophytes). Currently, only four of these species are documented in the watershed: *Cantherellus* spp., *Sparassis crispa*, *Hydnum repandum*, and *Phaeocoollybia* spp. The following factors have contributed to our limited knowledge about these species:

- Survey and inventory has predominantly been limited to vascular plants.
- Sightings are few and widespread for some species, indicating large gaps in range information.
- Only the most rudimentary of ecology data is available for many species; therefore, habitat requirements are essentially unknown for most of these species.
- Sighting location information is often general, lacking specific information.

***Unique or Uncommon Plants:*** The S. F. Alsea watershed contains plants species that are considered uncommon and of special interest. Some of these species are protected under the Oregon Wildflower Law (State of Oregon 1963) which makes it unlawful to export or sell or offer for sale or transport certain plant species. Some of these species likely to occur in the S. F. Alsea watershed include: *Calochortus* spp., *Calypso* spp., *Erythronium* spp., and *Rhododendron* spp.

***Private vs. Public Lands Considerations:*** Private forest lands within the watershed will be managed in accordance with the state of Oregon's Forest Practices Act (FPA) standards in place at the time of harvest. While management strategies vary between ownerships, the general trend on industrial forest lands within the watershed is to manage all stands under a 35 to 60-year rotation and to control competing vegetation by the application of herbicides. On these lands,

approximately two trees per acre are retained for use by wildlife. These trees are commonly located on the edge of units and/or next to riparian buffers. Under the existing FPA standards, the riparian buffers may decrease in size (width) in the future. This is because riparian widths are based upon the amount of tree volume (especially conifer basal area) adjacent to the stream channel. As trees adjacent to the stream grow larger (volume increases), trees can be cut and consequently, riparian buffer zones may decrease in width.

Landowners with smaller acreages in the watershed typically manage their lands for agricultural products and/or timber/firewood from small woodlots; their management strategy often differs considerably from industrial landowners and is more variable based on individual considerations.

Vegetation on public lands has been typically managed on short rotations (60 to 80 years) in the past. Approximately two snags per acre were retained for wildlife although this was not always achieved in harvest units; riparian buffer strips approximating 80 feet were retained. The primary factor impacting future vegetation patterns within the watershed is the change in management direction on federal lands from timber production (primarily through clearcut harvesting) to the development of late-successional habitat.

**Desired Future Conditions:**

- Management direction as established in the ROD for the Northwest Forest Plan. Watershed exhibits the full range of natural disturbances (i.e., animal damage, fire, landslides, insect outbreaks, windthrow, disease) and late seral/old growth vegetative development processes and ecological functions.

- Stands will contain moderate to high accumulations of fungi, lichens and bryophytes.

- Noxious weeds and other invasive non-native plant species do not proliferate above an acceptable level (*see pg. 64, Salem District ROD*).

- Harvests of timber and special forest products are based on local site conditions, sustainability, compatibility with ecosystem health and site productivity.

**Management Opportunities:**

- Use genetically local native plant materials in the revegetation of disturbed areas, especially in and adjacent to wetlands and other special habitats. If these materials are not available, use revegetation methods that do not encourage the introduction or spread of invasive non-native plant species.

- While late-successional forests take hundreds of years to develop naturally, site-specific silvicultural treatments may be able to hasten the development of older forest characteristics and uneven-aged stands. Variable-spaced thinnings can accelerate the development of large diameter trees with full crowns and large limbs; they also provide openings for the development of multi-layered stands by natural regeneration of conifer seedlings and vine

maple or by planting of shade-tolerant species such as western hemlock and western red cedar.

- Develop and/or maintain small meadows for use by many species of plants and wildlife.

- Provide snags and down wood in the size and decay class distribution reflective of the stand age. In moving toward late seral habitat, the desired level of snags and down wood would be at least the level at which they are found in natural mature conifer stands. Snags and down wood can be created by the girdling, topping or felling of trees.

**Data Gaps:**

- There is a lack of information on the development of late-successional forest conditions by the use of silvicultural methods. Current research and projects in the Adaptive Management Areas of the Salem District will continue to focus on appropriate silvicutural techniques to develop late-seral forest conditions.

**Monitoring Needs:**

- Establish a long-term, scientifically based monitoring system to follow the progress of stands treated to improve late-successional forest conditions.

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# ISSUE: WILDLIFE HABITAT

- ***Key Question: Are the present habitat conditions adequate to maintain wildlife species of concern ?***

**Background**:

The key issue concerning wildlife habitat within this watershed is the depletion of late-successional and old-growth (referred to as LS/OG) conifer forests that has occurred across the entire Coast Range Province. This concern has been the main focus of many recent scientific assessments and planning documents for this region (Thomas et al. 1990; Johnson et al. 1991; Noss 1993; Thomas et al. 1993; USDI-BLM 1995 [RMP], and USFS and USDI-BLM 1994a and 1994b [ROD]). Management activities during the past century and particularly within the last two decades have resulted in the depletion and fragmentation of the LS/OG forests; as well as, simplification of remaining habitats through the loss of habitat diversity, species diversity, and structural complexity. The pertinent ecological and biological processes related to wildlife habitat within this watershed have largely been discussed at the regional scale in the above mentioned documents.

**Present Conditions**:

The vegetation component of this landscape provides the basis for understanding the availability

of habitats for a wide array of wildlife species. At the watershed scale it is appropriate to categorize the available wildlife habitats by the seral stages of the various plant communities. Several plant communities and all possible seral stages are represented within this watershed (see Vegetation discussion). It is important to note that habitats, and the populations of species supported by those habitats, naturally change over time as changes in plant communities and seral stages occur. So there exists a natural range of variability for the habitats available to wildlife species within a particular landscape. This discussion of wildlife habitat conditions focuses on four primary factors which may limit the ability of the existing vegetation to provide habitat for wildlife in this watershed. These primary factors are: the condition of LS/OG forests, structural components of forest stands, special habitats, and road density. Estimates of these parameters are presented in Table 4.

As a result of natural and man-caused disturbances in this watershed, the LS/OG habitat is now greatly reduced and fragmented, and lies almost entirely on BLM lands. Where an older forest patch is surrounded by contrasting habitats (e.g., recent clearcuts, young stands, etc.), the edges of the older forest patch usually exhibit environmental conditions that are markedly different than the interior of the LS/OG patch. In addition to the variation in microclimate (e.g., humidity, temperature regime, light penetration) that exists between the edge and the interior of a patch, edge habitats often have a greater diversity of competitor species and predators than the interior of a patch. Thus, as the distance between older forest patches increases, and the proportion of edge to interior habitat increases, animals that are strongly associated with older forest habitats are likely to be adversely affected.

About 20 percent (8,297 acres) of this watershed exists in LS/OG habitat. Relatively large blocks of late seral forests (comprised mostly of 80 to 110 year old stands) still occupy considerable portions of the northern flank of Prairie Mountain. Most of the old-growth stands have been reduced to small, scattered patches. Many of the remaining LS/OG patches are so small that they do not contain interior forest conditions; that is, they are entirely affected by adjacent edges. Only 1.3 percent (526 acres) of this watershed exists in old-growth interior forest conditions. **Figure 6** presents the interior forest conditions within each subwatershed, and ***Map 7*** displays the interior forest conditions for LS/OG habitat.

The quality of wildlife habitat in forested landscapes depends on more than just the quantity of certain age-classes. The structural components within a seral stage often determines whether certain wildlife species are able to utilize a habitat. The elements of habitat structure of most concern within this watershed are: standing snags, down logs, sub-canopy layers, and species diversity.

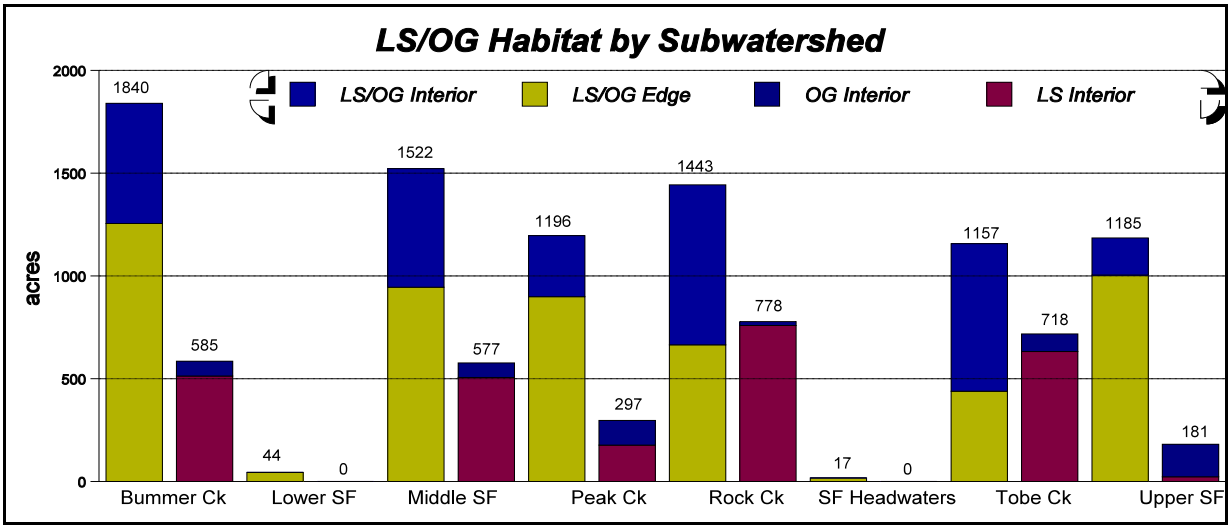


**Figure 6.** Interior forest conditions within each subwatershed.

Table 4 lists relative amounts of these four structural attributes of forest stands in this watershed. Past management activities have greatly reduced these components on both private and federal lands. Limited inventory work and local knowledge of this area suggests that all these structural features currently exist at very low levels for the entire watershed and for BLM-administered lands in general. With respect to specific stands, however, there are apparent differences. For example, many recent clearcuts on BLM have been found to contain very few hard snags with most of the down wood in advanced decay stages. In contrast, natural LS/OG stands like those on the north flank of Prairie Mountain contain abundant, high quality structural features. Evidence of structural diversity at the stand level can be seen in recent aerial photos (1993) which show several scattered clusters of recently dead trees (several trees to ½ acre patches) throughout the late seral stands in the watershed. These patches are likely caused by a combination of insects, disease, and moisture stress resulting from the past several years of below average rainfall (photos of the same area from 1988 show no sign of these patches).

The special habitats found within a watershed (e.g., wetlands, meadows, rocky outcrops, etc.) will often support a unique variety of wildlife species. Within this watershed a variety of wetland habitats are found such as seeps, springs, ponds, marshes, and swampy areas. Wetlands along the upper segments of the South Fork Alsea River, and forested seeps and springs in the upper reaches of all subwatersheds, currently provide habitat to a wide range of wildlife species (primarily amphibians, small mammals, and some invertebrates). In addition, rocky outcrops, talus slopes, oak/madrone patches, and grassy balds (such as those on the top of Prairie Mountain) provide much of the existing diversity of special habitats within the watershed. Unfortunately, there is little data available to provide a good estimate of the abundance of special habitats in the South Fork Alsea watershed (see Vegetation discussion). Forest site conditions based on the Salem District Timber Production Capability Classification (TPCC) provide some data, but these classifications are based on the capability of the land to produce timber rather than being based on ecological criteria. In addition, TPCC data are confined to BLM lands, and are probably most accurate for wetlands habitats.

One of the major factors affecting the use of habitats by wildlife is road density. The average density of road miles within the watershed ( 5.2 mi/mi$^2$ ) is much higher than the desired road density (1.5 mi/mi$^2$), as recommended by Oregon Dept. of Fish and Wildlife (ODFW 1990). This rather high average density for the watershed is quite typical of the Oregon Coast Range. Estimates of road density may not reflect an accurate density of the total road miles that are open and passable to vehicular traffic. For example, in some areas of the watershed, road density may be higher due to roads on private that are not accounted for in BLM inventory data. Also, many of the spur roads within BLM inventory data may not be passable due to ingrowth of shrubs and young trees in the roadway.

**Table 4. Summary of present conditions and trends for wildlife habitat parameters. March, 1995**

| PARAMETER | Total Watershed | BLM Only | Trend[a] | Remarks |
|---|---|---|---|---|
| LS/OG FOREST CONDITIONS | (acres) | (acres) | | |
| Late Seral (L S) total area | 6,173 | 5,914 | + | ingrowth expected in LSR |
| LS interior forest patches | 2,588 | 2,526 | + | all but 62 acres are on BLM lands |
| Old Growth (OG) total area | 2,124 | 2,110 | S | 14 ac. Private, 60 ac. GFMA, 2050 ac. LSR |
| OG interior forest patches | 526 | 526 | S | all significant interior OG patches are in LSR |
| HABITAT STRUCTURE | (value) | (value) | | value estimates: Low, Medium, High |
| Standing snags | Low | Low | S | harvest on private may negate stable trend |
| Down logs | Low | Low | S | harvest on private may negate stable trend |
| Sub-canopy layers | Low | Low | + | ingrowth and development expected in LSR. |
| Species diversity | Low | Low | S | diversity is essentially static in short term. |
| SPECIAL HABITAT FEATURES | | (acres) | | |
| wet meadows/marshes/ponds | no data | 640 | S | significant areas exist on BLM and private |
| springs/seeps/swamps | no data | no | S | seeps and springs are quite prevalent |
| dry meadows | no data | data | S | minor, more prevalent in adjoining |
| rocky outcrops | no data | 44 | S | watershed |
| talus slopes | no data | 6 | S | very minor habitat |
| caves/cliffs | no data | 4 | S | very minor habitat |
| | | no data | | very minor habitat, if present |
| ROAD DENSITY | | | | |
| Total road density (mi/mi$^2$) | 5.2 | | + | increases expected on private lands |

a. habitat parameters that show an increasing trend are represented by **+**, stable trends are represented by **S**, decreasing trends represented by **-**.

**Trends**:

No attempt was made in this analysis to quantify how much change has occurred in wildlife habitat conditions in the past 150 years since settlement has become established in western Oregon. While it is not possible to quantify the historic changes that have occurred within this watershed, it is possible to qualify these changes for the general landscape of the Oregon Coast Range. For example, we do know from reconstruction of historic forest inventory records (Teensma et al. 1991), forest vegetation potential (Franklin and Dyrness 1973), and fire-return intervals (Agee 1993) that old-growth habitat was much more abundant in the past. The dramatic decrease in the amount of old-growth from historic highs of 60% to 80%, down to the present 5% percent in this watershed, is perhaps the most striking change that has occurred to wildlife habitat.

Of considerable importance is the estimation of trends from current habitat conditions into the future. Our estimates of future habitat conditions (Table 5 ) are based on two major assumptions: (1) implementation of the ROD on federal lands, and (2) no appreciable change in the current management of non-federal lands. In the short term (next 20 years), the composition of most plant communities and their associated structural elements will be essentially static. One exception might be a decline in oak/madrone woodlands primarily as a result of harvest that is likely to occur on private lands at lower elevations within the watershed.

The amount and distribution of all seral stages will change in the short term, but it is difficult to predict the exact distribution of habitats across the watershed. No appreciable increase is expected in the amount of old growth habitat. In fact, due to the current rarity and vulnerability to factors such as windthrow and disease agents, there may be some loss of existing old growth in the near term. The age distribution of forests on BLM lands is expected to shift to late seral forest very slowly as a result of current forest management plans (ROD, RMP) which require establishment of Late Successional Reserves (LSR) and Riparian Reserves on federal lands. However, continued logging on private lands will dampen this effect for this watershed. Thus, the trend information in Table 5 reflects a balancing of forest harvesting on private lands with forest protection on BLM-administered lands.

Special habitats are expected to remain similar to current conditions over the next 20 years with the possible exception of dry meadows which are expected to decline due to natural succession and control of fire. Total road density within the watershed will likely increase as private forests managers re-open old roads or create new roads in young forest stands which will soon attain harvest age. Current management direction for roads on BLM lands involves reducing road densities primarily by blocking unused roads. The potential to close roads on BLM lands will likely outweigh the potential increase of new roads on private lands, thus road densities are expected to shift across the watershed toward private holdings.

In summary, it is difficult to determine whether currently available habitats will be adequate to support all wildlife species of concern in the near term. At the regional level, implementation of the ROD is expected to provide for the needs of most of the federally listed wildlife species (see the discussion on Wildlife Species). Within this watershed, however, several factors have been identified that contribute to an increased risk for loss of wildlife diversity. These include:

- very small total acreage of old-growth habitat, and the highly fragmented condition of these remaining patches which increases their vulnerability to fire, insects, and disease;
- low levels of snags and down wood, especially on past harvest units;
- lack of knowledge about the amount and condition of special habitats;
- current high road density, with total road density likely to remain high.

There are also a few factors which serve to reduce the risk to wildlife diversity:

- the currently low rate of habitat modification, compared to the recent past, due to the greatly reduced harvest levels on federal lands;
- a large block of federal ownership in Tobe Creek, Rock Creek, and upper Bummer Creek, which is currently a contiguous patch of late seral habitat;
- the abundant opportunities for reducing open road density on BLM lands.

**Desired Future Conditions**:

The desired future conditions for wildlife habitat are tiered to the management direction which has been outlined for each land use allocation described in the ROD and RMP (see pp. 23 - 32). The overall goal of this management direction is to maintain the biological diversity and ecosystem health of the watershed, thereby contributing to the persistence of healthy wildlife populations. The desired future conditions that are most pertinent for wildlife habitat on BLM lands include:

- lands designated as LSR will attain a contiguous pattern of late seral forest and old-growth conditions, thus reducing fragmentation and increasing interior forest conditions;
- old-growth stands currently adjacent to high contrast edge habitat (recent clearcuts) will become surrounded and buffered by late seral forest habitat;
- early seral habitat within Riparian Reserves will be greatly reduced, thereby benefitting species in need of riparian vegetation and species requiring contiguous dispersal habitat;

- the amount and condition of coarse woody debris (snags and down logs) will be at least sufficient to support cavity nesting birds at 60% of potential population levels;

- special habitats will be inventoried, maintained, and where needed they will be enhanced;

- the density of open road miles will be greatly reduced, approaching the recommended level of 1.5 miles per section on BLM lands.

**Management Opportunities:**

Implementation of the standards and guidelines required by the ROD and RMP will generally improve the condition of wildlife habitats on federal lands within this watershed. Management activities that contribute to recovery of late seral habitat conditions at the landscape level, as well as increase structural diversity within stands, have been discussed in a recent Interagency Assessment which covers LSR and Riparian Reserve lands for this area of the Oregon Coast Range (USDA-Siuslaw National Forest 1995). The LSR Assessment presents selection criteria for identifying stand conditions that are most amenable to manipulation and for prioritizing stand treatments based on wildlife resource needs. These LSR Assessment guidelines are generally applicable to the South Fork Alsea watershed. Additionally, the following management recommendations will also contribute to structural diversity and protection of special habitats within this watershed:

- commercial thinnings on GFMA lands should include measures to increase coarse woody debris (CWD) levels, such as topping or felling of trees that meet or exceed average stand diameters. An adequate inventory of CWD should be conducted on all project areas identified for thinning. Areas likely to benefit most by enhancing CWD levels are the South Fork Alsea Headwaters and Upper South Fork Alsea subwatersheds. These subwatersheds are currently dominated by conifer and mixed hardwood/conifer stands in the 40 to 70 year age class, and these stands are located farthest away from LS/OG patches where CWD levels are higher;

- density management opportunities in LSRs should focused at improving the corridor of dispersal habitat in Middle South Fork, Upper South Fork, and Peak Creek subwatersheds, since existing LS/OG habitat in this area is highly fragmented (see Figure 6 and Map 7). In other parts of the LSR it may be appropriate to forego density management opportunities in the 40 to 70 year age class, since most of these stands are adjacent to larger patches of LS/OG, many stands are already are showing adequate levels of species diversity and sub-canopy development, and all of these stands currently function as dispersal habitat for spotted owls;

- consideration should be given to prioritizing density management and precommercial thinnings adjacent to highly exposed and fragmented old-growth patches, such as those in the northern part of the Upper South Fork Subwatershed. Hastening the

development of mid-seral habitat around these patches will lessen the edge contrast, afford better wind protection, and contribute to better interior forest conditions;

- blocking and decomissioning of roads will benefit the functioning of the terrestrial ecosystem. From the viewpoint of wildlife habitat, priority should be given to LSR and Riparian Reserves over GFMA lands. Within the LSR, prioritize Tobe, Rock and the upper portions of Bummer Creek since reducing open road miles in these areas will immediately benefit the conditions of the large LS/OG patches, and will also benefit elk habitat needs;

- special consideration should be given to initiating an inventory and field review process of special habitat features within this watershed. The current lack of information places the existing wildlife and plant diversity in this watershed at risk.

**Data Gaps**:

There are two primary data gaps with regard to overall understanding of wildlife habitat conditions: (1) lack of baseline inventory for coarse woody debris on managed and unmanaged stands within the watershed, and (2) lack of information on the quality and quantity of special habitat features within the watershed. These two shortfalls limit our ability to recognize restoration and enhancement projects that would benefit these components of wildlife habitat.

**Monitoring Needs**:

BLM planning regulations (Code of Federal Regulations 43:1610.4-9) call for the monitoring and evaluation of resource management plans at appropriate intervals. Wildlife habitat monitoring (as well as other monitoring) will be conducted according to guidance presented in the Salem District RMP, and subsequently reported in an "Annual Program Summary". Some level of inventory and monitoring of coarse woody debris and special habitat features should be accomplished through implementation of RMP.

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# ISSUE: WILDLIFE SPECIES

- ***Key Question: Will the current direction of federal land management plans provide for the needs of all wildlife species of concern ?***

**Background:**

Recent federal land management plans (ROD, RMP) have set land use allocations and standards and guidelines for federal lands, which collectively have the potential to greatly affect the current

trend and distribution of wildlife habitat This management direction is specifically designed to conserve and recover many imperiled wildlife species. Implementation of these plans is expected to benefit a great diversity of species, especially those associated with old-growth forests, like the marbled murrelet and the spotted owl. By addressing the issues concerning wildlife habitat (see previous issue discussion), it is hoped that the overall diversity of wildlife species within this watershed will be maintained. However, concern for the regional viability for many species has been raised in several in many of the recent planning documents and scientific assessments (see Thomas et al. 1993, USDA-FS and USDI-BLM 1994a, USDI-BLM 1995). These species are listed in Table C-3 of the ROD. For a great number of these species, key life-history information (e.g., habitat relationships, population size, distribution) is poorly known; and therefore "educated guesses" regarding a viability are limited to the regional scale for many species. In addition to special attention species listed in Table C-3, there are several species likely to occur within the Coast Range that are listed or being reviewed for listing (candidate species) under the Endangered Species Act. Also within the Coast Range there are species for which there is often significant local concern related to social, economic, or cultural issues. For all these species, collectively referred to as "Species of Concern" (including listed, candidates, special attention species, and species of local concern), it is assumed that their population size and distribution will be benefitted or limited by the amount and trend in their preferred habitat.

**Present Conditions:**

The present condition of species of concern within the watershed is discussed below. Refer to *Appendix 5* for a list of the species that were considered in this analysis.

Amphibians. The red-legged frog, tailed frog, and southern torrent salamander are candidate species known to occur within the watershed. All of these species are closely associated with riparian habitat. The tailed frog and southern torrent salamander are closely associated with clear, cold, headwater streams, springs, and seeps. The red-legged frog is more often found in larger streams and wetlands. Conditions of upland habitats are important for the red-legged frog and tailed frog which often move through the terrestrial ecosystem when dispersing. Regionally the populations of these species are believed to be declining, due to loss riparian habitat and loss of key components from the terrestrial system (e.g., large LS/OG patches, coarse woody debris). The most protected headwater streams in the watershed are those within the upper Bummer, Tobe, and Rock Creek subwatersheds. Also, significant larger wetland habitats occur within the Headwaters and Upper South Fork subwatersheds. The limited survey information for these species suggests that they are currently well distributed within the watershed.

Northwestern Pond Turtle. The pond turtle is a rare species, that prefers the habitat of marshes, lakes, ponds, and slow-flowing rivers and creeks. It uses terrestrial habitats for nesting, overwintering, and dispersal. This species is sensitive to loss of habitat and human disturbance. Additionally, the recruitment of young turtles into the population may be limited by introduced predators, such as the largemouth bass and bullfrog. The nearest known location of this species is the Findley Wildlife Refuge, located five miles to the east of the watershed. The extensive beaver ponds and wetlands of the Headwaters and Upper South Fork subwatersheds may offer

undisturbed habitat within a reasonable dispersal distance from the refuge population. These special wetland habitats have not been surveyed for this species.

Northern Spotted Owl. The BLM first began surveys for spotted owls in this and adjoining watersheds in 1975. Since 1986 the yearly surveys efforts have been fairly consistent, and a banding program was implemented to allow for identifying individual owls and tracking their yearly survival and reproduction. The spotted owl's preferred habitat for nesting, roosting, and foraging is late seral and old-growth forests. The conditions within each known owl site was evaluated by tallying the amount of suitable habitat (on both federal and private land) that lies within a 1.5 mile radius of the site center. The total area enclosed by such a circle (4,500 acres) approximates the median home range (MHR) for spotted owls in the Oregon Coast Range. Twelve owl sites were evaluated using this method, including six sites that lie within, and six sites that lie adjacent to (within 1.5 miles of ) the watershed. Only seven of these sites are currently considered to be occupied by either a pair or resident single owl. Federal ownership accounts for more than 40% of the MHR for 5 of the 7 active sites. Yet, only two of the seven active sites have over 30% suitable habitat in their MHR. Over the past 10 years, reproduction has been very poor, with only 11 juvenile owls produced from five of the twelve sites. Subsequent tracking of these juveniles has shown that at least 4 of the 11 young owls died before dispersing away from the nest area.

Six of the seven active sites occur on LSR lands. But only two of these sites occur with a Critical Habitat Unit (CHU: OR-48). This watershed lies at the northern edge of OR-48, which includes numerous owl sites. The CHUs to the north of this watershed have relatively few owl sites, and thus, recovery of owl populations in areas farther north in the Coast Range will require that juvenile owls produced in OR-48 have adequate dispersal habitat to move north. About 55.7% of the entire watershed is considered dispersal habitat. This habitat is arranged in a pattern of large patches in the southwest part of the watershed, which link to smaller patches through the center, and up into the northeast portion of the watershed. The weakest link in this chain of dispersal habitat is in the northern and eastern portion of this watershed where the late seral forest patches are highly fragmented and surrounded by very young plantations and recent clearcuts.

Future management activities on federal lands are not likely to result in the incidental take of spotted owls, since all but one of the active sites occur on LSR, and loss of suitable habitat or modification of critical habitat is unlikely. In some cases federal management actions might involve projects that pose a risk of disturbance to owls, if such projects are situated within a ½ mile of active sites.

Marbled Murrelet. This species, which flies inland from the coast to nest in late seral and old-growth forests, has been detected at only four locations within this watershed. The western edge of this watershed lies 24 miles from the coast. There is currently about 2,124 acres of suitable habitat available within the watershed. All, but 65 acres of this habitat is designated LSR which has also been proposed as critical habitat for this species. Very few surveys have been conducted for murrelets in this watershed, and a thorough inventory of the best available habitat (remnant old-growth patches) has not been attempted. Future management activities on federal lands are

not likely to result in the destruction of murrelet habitat or proposed critical habitat, yet the incidental take of murrelets may still occur from actions that pose disturbance risks to murrelet habitat.

Bald Eagle. Bald eagle sightings within this watershed generally occur in late fall, though winter, and into early spring. Eagles appear to be attracted to spawning salmon runs during this time of year. The few eagles that are observed here, appear to be foraging on spawned out salmon, road kills, and occasionally on carrion encountered on agricultural lands. These eagles also require suitable roosting sites, which are often in the remnant old-growth patches adjacent to the valley margins. It is unlikely that this watershed is capable of supporting a breeding pair of eagles. Although a pair of adult eagles was observed repeatedly during the early spring of 1994, no breeding behavior was observed. The ability of this watershed to support a small transient population of wintering eagles will likely be enhanced by recovering anadromous fish runs and protecting suitable roosting sites.

Harlequin Duck. This candidate species is a rare breeder in the Cascades that winters along the rocky shorelines of the Oregon Coast. There is one confirmed breeding record for this species in the Coast Range. There is no survey information or known site locations for this species within this watershed, and it is unlikely that this watershed will ever become important for recovery of this species, since it appears to be a rare breeder at the edge of it's range

Red Tree Vole and White-Footed Vole. The red tree vole is likely to be found in late seral forests within this watershed. This species is a special attention species, requiring that Survey and Manage (S&M) guidelines be met before initiating ground disturbing projects within suitable habitat. White-footed voles are a candidate species that is documented to occur within this watershed. This species has most often been found along small streams with dominant red alder stands, and usually associated with heavy cover, such as down logs dense shrubs. This species is among the rarest mammals in the Pacific Northwest, having been collected from only a few sites, including the mixed alder/conifer forest stands near Alsea Falls Park. Connectivity of riparian hardwood stands, and the conditions of coarse woody debris within riparian areas, may currently be limiting factors for white-footed voles in this watershed. Forest management activities that affect conditions of late seral forest, riparian forests, or coarse woody debris will have a high potential for impacting both of these small mammals.

Pacific Fisher. This species appears to be very rare in Oregon, and few records exist for the Coast Range. This species is most often associated with large blocks of forest habitat, and is believed to prefer late seral habitats which offer adequate structural features (e.g., large snags, down logs) for denning and roosting sites. Statewide, the trapping of this furbearer has been closed since 1937, yet populations have not rebounded. This suggests that other factors such as, habitat fragmentation, isolated populations, and very low reproductive rates may be affecting the viability of this species on a region-wide basis. There is no survey information or known site locations for this species within this watershed.

Roosting Bats. The long-eared myotis, long-legged myotis, Yuma myotis, fringe-tailed bat, and silver-haired bat are likely to occur in late seral and old-growth forests within the watershed.

Structural features of the older forest stands, including large snags, tree deformities, prominent flaking bark, and thick foliage are known provide suitable roosting sites for these species. These bats may forage over a variety of forest stands. Riparian areas with late seral forest conditions may be particularly important, since the insect swarms associated with a nearby water source will provide good foraging habitat in close proximity to roosting sites. There is no survey information or known site locations for these species within this watershed. The potential impact on these species by forest management activities in this watershed is unknown. But, considering the association of these species with late seral forests, snags, and riparian areas, the risk of impact is likely to be quite high if these species are present. Surveys for these species will be needed to comply with the S&M guidelines established in the ROD, and monitoring guidelines set forth in the RMP.

Roosevelt Elk and Black Bear. Populations for both of these game species appear to be increasing within the watershed. Damage complaints to agricultural crops and young plantations also appear to be on the rise for both of these species. Elk damage is especially a concern in the lower portions of Bummer Creek and Lower South Fork subwatersheds. There is concern that current management direction, which emphasizes older forest conditions on federal lands, will further reduce available forage for elk, thereby increasing damage complaints on private lands in this watershed.

Currently about 12.8% of the watershed (5.1% on BLM and 7.7% on private land) is potential forage habitat for elk. This level of forage habitat is well below the 20% recommended by ODFW (1990). Thermal cover comprises 43.9% of the watershed (23.9% on BLM and 20.0% on private lands), and is defined as those forest stands greater than 50 years old and less than 160 years old. Optimal thermal cover, which is defined as 160 years old and older, is extremely scarce (only 4.1%) in this watershed and lies almost entirely on BLM lands. The quality of elk habitat is also influenced by its exposure to human disturbance. Elk that use habitats within areas of high road density, are more vulnerable to disturbance and poaching. As noted earlier, road density is very high within this watershed.

Invertebrate Species. Very little is known about invertebrates in the forested ecosystems of the Oregon Coast Range. There is a reasonable likelihood that the four special attention species listed in Table 1 of Appendix 5 may occur within this watershed. These species are most often found in moist forest conditions associated with down logs, riparian habitat, and remnant old-growth patches. The dispersal potential for these species can be severely affected by the high degree of fragmentation of late seral forests. The occurrence of two SAS Beetle species is also unknown within this watershed. Three of the four documented sites for Roth's blind beetle occur in two watersheds immediately to the north of the South Fork Alsea Watershed. Recent efforts to find Roth's blind beetle in the Prairie Peak area were unsuccessful (LaBonte 1994), yet a new species of blind beetle was discovered there (*Annilodes* spp.). It is highly likely that this new beetle could occur within this watershed; it may be limited to the old-growth habitats at the higher elevations around Prairie Peak. The Oregon giant earthworm is likely to occur in stable older soils in this part of the Coast Range. No surveys or locations of this candidate species are known for this watershed.

**Trends:**

Wildlife populations will generally coincide with the trends in available habitat. As noted in the discussion of trends in Wildlife Habitat, late seral forests are expected to increase, whereas early seral habitats will decrease and shift spatially away from LSR lands toward GFMA and private holdings. The populations of the following species are expected to increase as habitat in LSR and Riparian Reserves recovers toward late seral forest conditions: red-legged frog, tailed frog, southern torrent salamander, northern spotted owl, marbled murrelet, red tree vole, white-footed vole, and all bat species.

The population trend for the following species cannot be extrapolated from expected increases in late seral forest habitat: bald eagle, black bear, and Roosevelt elk. Habitats other than late seral forests are required to meet the needs of these species. Bald eagles in western Oregon are most often associated with large bodies of water (e.g., large rivers, lakes, reservoirs, and estuaries) which provide a stable food source (primarily fish). To the extent that anadromous fish runs recover, the wintering population of bald eagles within this watershed will remain stable or increase. Early seral habitats (e.g., clearcuts, meadows, young plantations) are important foraging habitats for black bear and elk. Black bear populations may increase as recent hunting restrictions are likely to reduce the harvest pressure on the current population. The damage caused by bears on young plantations is also likely shift more toward private lands. The elk population is currently on the increase. As available forage habitat shifts away from LSR lands and onto private lands the potential for damage to young stands and agricultural lands will increase.

An assumption used in the RMP analysis was that private lands would produce the forage needed by elk due to the shorter rotation lengths normally practiced by private landowners. However, in the S. F. Alsea watershed, many of the stands on private lands are in the 30-50 year age class, and may not be harvested for several years. Meanwhile, the forage quality of recent clearcuts on both BLM and private lands, will continue to decline, as plantations become established on the cutover areas. A sharp rise in the amount of forage habitat may therefore be several years off, and the low levels of forage habitat that will be available in the interim, may mean increased damage complaints on private, non-forested lands. Efforts toward cooperative management by BLM, ODFW, and private landowners will ultimately determine the trend in the elk population within this watershed.

There is very little, or in some cases, no information to adequately assess the current distribution and trends for the following species: northwestern pond turtle, harlequin duck, Pacific fisher, and all the invertebrates. These species may be limited by more than just the availability of suitable habitat. For instance, the pond turtle and fisher may be limited by demographic factors (e.g., poor recruitment, isolated populations, very low population density) which preclude their ability to respond to a local increase in available habitat.

**Desired Future Conditions:**

The desired future conditions for wildlife species within this watershed are closely tied to the

management direction outlined in the ROD and RMP. These management plans are designed to maintain biological diversity and promote healthy populations of all native wildlife species on federal lands. The high percentage of LSR-designated lands is a dominant factor in this watershed which will mostly provide habitat for those species associated with late seral forests. The spatial relationship of this watershed to adjacent watersheds is significant for promoting a north-to-south dispersal corridor of late seral habitat for this portion of the Coast Range. Within this watershed, all currently documented species are expected to be maintained or increased as described below:

- populations of those species closely associated with late seral and old-growth forests will remain stable and well distributed as habitat conditions recover in LSR and Riparian Reserves.

- species dependent on habitats other than late seral forests will be maintained and where possible enhanced, as a result of forest management on all land allocations, and cooperative management with state and local interests.

- the status of those species for which distribution information is currently lacking (*see Table 1, Appendix 5*) will be better understood in this watershed as a result of inventory and monitoring efforts outlined in the ROD and RMP.

**Management Opportunities:**

The management direction outlined in the ROD and RMP will greatly improve wildlife habitat conditions (see also Management Opportunities for Wildlife Habitat), which will benefit the species considered in this analysis. However, it is important to remember that a strict focus on conducting enhancement projects designed to achieve future landscape level objectives, may result in substantial short-term impacts to a species within the watershed. For instance, precommercial thinning of all stands adjacent to unsurveyed old-growth patches may benefit future late seral forest conditions, but could incur significant incidental take to marbled murrelets or spotted owls in the short-term. Therefore, opportunities that further the long-term objectives of wildlife habitat must be evaluated in light of potential short-term and site-specific impacts to wildlife species within this watershed. In addition to management direction outlined in the ROD and RMP, some specific opportunities that will benefit wildlife species in this watershed are as follows:

- investigate the potential of the wetland habitats in the Upper South Fork Alsea River and SF Alsea Headwaters subwatersheds to provide habitat to northwestern pond turtles. These wetlands may offer undisturbed, predator-free (i.e. largemouth bass and bullfrogs) habitat within a reasonable dispersal distance of a known turtle population.

- survey the remaining old-growth patches for the presence of marbled murrelets. In addition to project level surveys needed for consultation purposes, surveys of the best available habitat will help provide a much needed picture of current murrelet distribution within the upper Alsea River Basin.

- initiate partnerships with ODFW and local landowners to benefit elk populations on federal lands and reduce damage complaints on private. The RMP has specifically recognized two opportunities for elk management which emphasize road closures and forage seeding within this watershed:

  (1) Bummer Ridge vicinity. This area has a growing elk herd, significant damage on adjacent private lands, is designated as LSR, and has good potential for controlling access from a few closure points on BLM).

  (2) Alsea Falls vicinity. This area has a growing elk herd, is designated as LSR, and access is controlled by BLM at a few key points.

These two areas as well as other areas in this watershed should be evaluated in the near future in order to address the immediate need for damage relief, and to help ODFW attain management goals for elk within the Alsea management unit. Additionally, These elk management areas represent excellent opportunities to address two important questions facing the management of federal lands under the ROD:

(1) can forage pressure on private lands be reduced by restricting road access and increasing forage opportunities on federal lands designated as LSR ?

(2) can management practices which provide or maintain forage habitat for elk (e.g. underburning thinned stands, heavy thinnings with small patch openings, and conversion of road spurs to managed forage plots) still meet the long-term goals for LSR designated lands ?

- initiate, or assist in, species assessments at different spatial scales. Interagency efforts to analyze species viability at the River Basin or Province scale will greatly enhance our understanding of many special attention species. The risk associated with decreasing the interim widths of Riparian Reserves will be better understood as information and habitat conditions on special attention species are addressed at these larger scales. Also, management of species that may be limited to unique habitats (e.g., Roth's blind beetle, Prairie Peak blind beetle) will be better served by addressing regional distribution questions in a cooperative process.

- Inventorying the special habitats in this watershed, as noted in the Wildlife Habitat discussion, could significantly increase the knowledge of overall species diversity for this watershed.

**Data Gaps:**

For many of the species discussed in this analysis the available information on population size, distribution, and life history requirements is poorly documented, or unknown. Also, the lack of inventory information concerning special habitats and the species that may occur on them is a limiting factor for assessing the risks to species viability within this watershed. For example, the

risks posed to special attention wildlife species by modifying or reducing the interim Riparian Reserve widths is currently unknown. Inventory and analysis efforts at the Basin or Province scale for these special attention species will allow for a better estimation of risks to these species.

Analyses at both the larger scale (e.g. evaluating invertebrate distribution at the province level) and smaller scale (e.g., project level inventories of wetlands associated with riparian hardwoods) will further our knowledge of overall wildlife diversity within this watershed. In addition, the application of new analytical tools (e.g. Province-wide Habscape analysis), and re-evaluation of current data sources (e.g. forage habitats for elk) will benefit future analyses of this watershed.

**Monitoring Needs:**

Survey and Manage requirements of the ROD and monitoring requirements of the RMP will involve a substantial commitment to surveying for listed species, candidate species, and SAS species. No additional species monitoring is proposed for this watershed.

# AQUATIC

## ISSUE: WATER QUALITY AND HYDROLOGY

**Key Questions:**

**Water Quality**

- *What are the characteristics of streams in the basin relative to water quality standards set by the State of Oregon?*

- *Where do stream temperatures exceed State of Oregon standards for maintenance of aquatic biology, and how does this relate to riparian stand condition and forest management?*

- *Where do stream turbidities exceed State of Oregon standards? What are the characteristics of the natural sediment regime (delivery and routing) in the watershed? Where are the potential sources of accelerated sediment input to streams and how does this relate to water quality, aquatic biology and, forest management?*

- *Where are the stream channels and what are the limits of perennial, intermittent and ephemeral flow? What is the timing and delivery of high flow/flood events and how does this relate to watershed and stream conditions, and forest management. What is the characteristic base flow regime in the basin and how does this relate to watershed and stream conditions, and forest management?*

**Stream Function**

- *What are the limits of the riparian management zone as defined by the ROD?*

- *Are stream channel physical variables (structure, gradient, substrate, sinuosity, width/depth ratio, etc.) in balance with the landscape setting (i.e. landform, geology and climatic region)? What is the relationship between forest management and channel conditions?*

- *Are plant communities in the riparian area and adjacent uplands an adequate source of long-term large wood recruitment to both the channel and flood plain? What is the relationship between forest management and the condition of the riparian vegetation?*

**Present Conditions:**

***Water Quality***

State of Oregon water quality standards and rules to protect the designated beneficial uses of state waters are set forth in the Oregon Administrative Rules, Chapter 340, Division 41. Table 7 displays the parameters that are applicable to waters on BLM-administered lands in the S. F. Alsea as well as the current data by subwatershed Of the parameters listed here, the BLM has only consistently collected data on stream temperature (and this at only four locations since 1993). Data has not been consistently collected by the BLM for the parameters and locations marked NA (not applicable) on Table 7 due either to cost and time constraints or the poor correlation between the parameter and forest management activities (see Monitoring Guidelines to Evaluate Forestry Activities on Streams in the Pacific Northwest and Alaska, EPA/910/9-91-001).

The 1988 Oregon Statewide Assessment of Nonpoint Sources of Water Pollution conducted by the DEQ listed portions of the Lower and Middle S. F. Alsea as moderately impaired without supporting data (based on observation) for the following beneficial uses: cold water fisheries, other aquatic life, and water contact recreation. Problems cited were: excessive turbidity, sediment and erosion attributed to forest management activities and agriculture. No further investigation of these problems is known to have occurred and S. F. Alsea was not cited as "water quality limited" in the DEQs 1994 305(b) report on water quality (DEQ 1994). Additional data or reports on water quality in the S. F. Alsea may be available through other agencies and/or individuals but, as of this analysis, has not been located.

Grab sample data for turbidity, Ph, conductance, temperature and base flow (collected on 9/29/94 and 12/1/94), while useful as a general indicator of water quality conditions at that moment in time, is not sufficient to characterize water quality trends or the maintenance of state water quality standards. Without additional data collected over a period of time it is not possible to state with any certainty whether or not water quality standards in the S. F. Alsea (or portions of the watershed) have been maintained or are currently at acceptable levels.

## Table 7. State of Oregon Water Quality Standards and Data Availability.

| Water Quality Standards [1] | Bummer Creek | Rock Creek | Peak Creek | Tobe Creek | Lower SF Alsea | Middle SF Alsea | Upper SF Alsea | SF Alsea Headwaters |
|---|---|---|---|---|---|---|---|---|
| Temperature[2] (F) | NA | NA | NA | NA | NA | NA | NA | NA |
| Turbidity[3] (NTU) | NA | 10-12 | 13 -27 | 17-20 | 32 | 25-32 | 22 | NA |
| Ph[4] (0-14 scale) | NA | 7.7 | 7.1 | 7.2 | 7.4 | NA | NA | NA |
| Temperature (F) | | 57 | 58 | 57 | 66 | | | |
| Conductance (US) | | 104 | 53 | 85 | 60 | | | |
| Other[5] | NA | NA | NA | NA | NA | NA | NA | NA |
| Baseflow[6] (CFS) | NA | 1.0 | 2.9 | 0.4 | 6.7 | NA | NA | NA |

1. See Appendix 7. Oregon Administrative Rules for description of "not to exceed standards" for the Mid Coast Basin.
2. Continuous stream temperature sampling during summer low flows was conducted at four locations in SF Alsea. Temperature standards are currently under review.
3. "Grab" turbidity samples were collected on 12/1/94 at bank full flow. NTU = nephelometric turbidity units.
4. Point samples for temperature (F), Ph, and conductance (US = UMHOS/CM: no water quality standards have been established for this parameter) were collected at selected locations (see Base Flow below) on 9/29/94.
5. Includes dissolved oxygen, coliform bacteria, organics and heavy metals, total dissolved solids, etc..
6. Base Flow was measured at four locations (see Map 9) in SF Alsea watershed on 9/29/94. CFS = CUBIC FEET/SECOND (no water quality standards have been established for this parameter).

***Stream Temperature Analysis*:** Analysis of S. F. Alsea streams for risk of temperature increases during summer low flows was conducted using ARC/INFO techniques (see *Appendix 6* for analysis objectives and methods). Maintaining appropriate stream temperatures during low flow and the processes linked to this are considered to be critical in achieving the aquatic conditions outlined in the Aquatic Conservation Strategy. Figure 7 displays total kilometers of streams in subwatersheds of the S. F. Alsea watershed with high, moderate, or low risks of adverse temperature increases during summer low flow; generally, sustained temperatures in excess of 58 degrees Fahrenheit are detrimental to sensitive aquatic species. Figure 8 shows high risk streams for BLM-administered land only. (Appendix 7 displays these data in tabular form.).

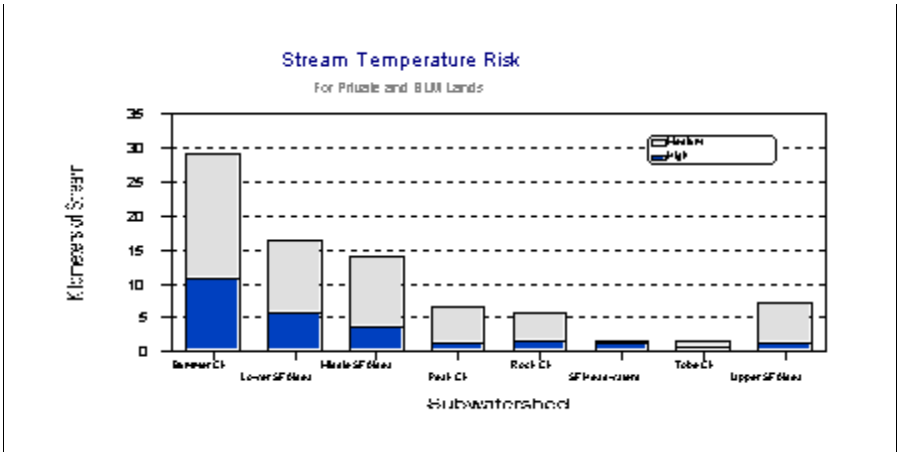


**Figure 7** Risk of having adverse stream temperatures during low summer flows in all subwatersheds.

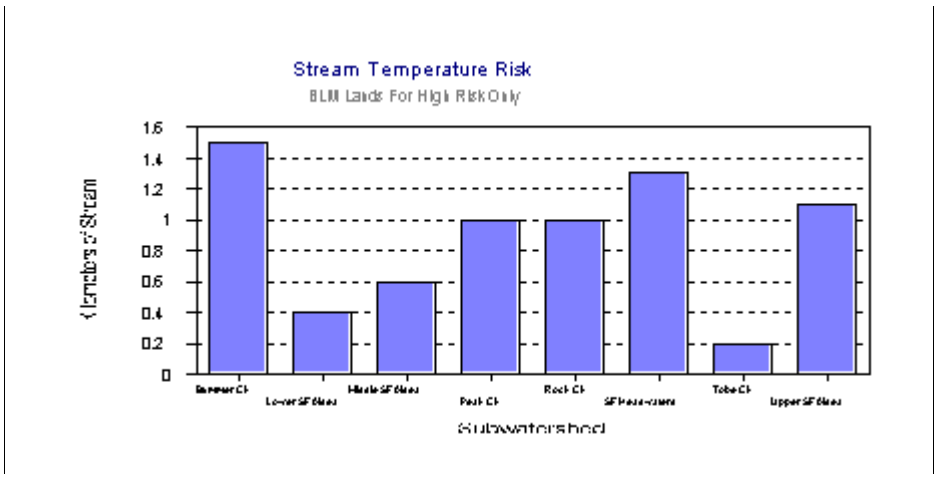


**Figure 8** Streams with a high risk of adverse stream temperatures on BLM land only.

Map 9 displays all streams in the S. F. Alsea watershed by temperature risk classification. Of the

671 km of stream in the S. F. Alsea watershed, 26.4 km (4%) are at high risk for temperature increases; 56 km (8%) at moderate risk; and 589 km (88%) at low risk. Of the 26.4 km of high risk streams, 7.7 km (29%) are administered by BLM. The remaining 18.7 km are on private lands, predominately in low gradient agricultural zones at the mouth of Bummer Ck. and Lower S. F. Alsea subwatersheds. These two subwatersheds contain 16.5 km (63%) of the high risk stream and are high priority candidates for temperature monitoring in the summer of 1995. Most of the remaining high risk streams are located between moderate or low risk sections, implying a lower risk and therefore a lower priority for monitoring. Streams with the highest risk for exceeding stream temperature guidelines are the highest priorities for stream temperature monitoring in 1995/1996.

Tobe Creek offers an opportunity to increase our understanding of critical stream temperature issues in the Coast Range. Stream temperature data from 1993 indicate high stream temperatures during summer base flow on Tobe Creek. In the summer of 1994, two additional Hobo temperature monitors were placed on Tobe Creek (Reach # 4TOBE004) in an attempt to further characterize stream temperature regimes during summer base flow. These data have not yet been analyzed.

***Sedimentation Analysis*:** The BLM collected turbidity data with grab samples at several sites in the S. F. Alsea watershed. These data showed a slight trend of increasing turbidity from the Upper S. F. Alsea to the mouth on Lower S. F. Alsea (Snedaker, Salem District files). This was not unexpected as turbidity tends to increase with flow. Peak Creek showed higher levels of turbidity compared to Rock and Tobe Creeks, but this may only reflect higher flows in Peak Creek and was not attributed to any particular point source or forest management activity. Although these data do not indicate any point sources of high sediment inputs to the S. F. Alsea watershed, they represent only one moment in time. They are not adequate for indicating exceedance or maintenance of water quality standards or for characterizing the sediment regime in the basin.

Some potential sources of accelerated sediment delivery to streams were identified during the BLM's summer 1994 road inventory (Transportation Management Plan - Salem District files, unpublished) in the S. F. Alsea watershed and the 1994 stream inventories on Tobe, Rock and Peak Creeks. Recommendations for treatment of these sources are listed below under restoration opportunities.

Additional sediment sources (both in stream and from roads), especially on private lands, are likely within the watershed but remain unidentified for this analysis. It is not possible to state with any confidence whether or not accelerated stream sedimentation is degrading water quality in the S. F. Alsea watershed (or portions of the watershed) with impacts to beneficial uses such as cold water fisheries. A comprehensive, site-specific, and documented understanding of sediment delivery and routing in the S. F. Alsea watershed is currently beyond the capability of the BLM Salem District. Substantial investments in data collection, training, and analysis would be necessary to provide for a high level of confidence in our understanding of this critical process. Due to extreme time and cost constraints, this investment is currently a low priority.

***Other Water Quality Parameters and Stream Flow*:** Data for pH, temperature, and conductance collected on 9/29/94 in the S. F. Alsea watershed did not exceed state standards (no standards exist for conductance). Data for coliform bacteria, dissolved oxygen (DO), organics, heavy metals, and dissolved solids were not collected. Of these parameters, only DO and tests for N, P, and organic residues from herbicide and pesticide application are likely to be useful for monitoring the effects of forest management activities. The application of herbicides and pesticides is not allowed on public lands but may occur on private lands in the watershed. Forest fertilization with urea is also a potential point source of water pollution but monitoring data was not located. Sources of coliform bacteria pollution of S. F. Alsea waters may exist on privately owned agricultural lands in the Lower S. F. Alsea and in the vicinity of high recreation use riparian zones, but are assumed to be unlikely along upland streams. With high cost and time constraints, collection of these data by the BLM are a low priority relative to temperature and sediment except when specific projects (i.e., forest fertilization) require this.

Streams in the S. F. Alsea are currently ungauged and data on stream flow was not available for this analysis. Although it is recognized that stream flow is a critical factor in watershed processes, no attempt was made in this analysis to characterize the flow regime in the S. F. Alsea or its tributaries. The rationale behind this decision is based on: 1) documentation and understanding of the linkage between forest management and stream flow is poor resulting in low confidence in our ability to predict or manage resources based on this type of analysis; 2) lack of data and access to modeling significantly reduces the usefulness of this type of evaluation; 3) evaluation of the condition of riparian vegetation and stream channels was deemed a higher priority due to the higher potential, in the short term, for understanding and managing these factors.

The potential to model stream flow in the Coast Range is being developed in cooperation with USGS and may be applied to this watershed during future iterations of this analysis. Measurements of flow taken on Lower S. F. Alsea River, and Tobe, Rock and Peak Creeks on 9/29/94 (Table 6) probably approximate base flow for these basins.

The stream channel network for the S. F. Alsea watershed was previously mapped and installed in the Salem District's Geographic Information System. Inadequacies in this data theme (poor representation of lower order ephemeral streams) were partially mitigated by a hydrography theme updating process in 1994. Despite this improvement, inadequacies remain and more precise mapping of stream channels as well as delineation of the limits of flow (perennial, intermittent, ephemeral), stream gradients, and confinement classes are a high priority data gap. For the purpose of this analysis, all second order and greater stream channels were assumed to be perennial. The actual range of perennial, intermittent, and ephemeral flow fluctuates with rainfall and will be determined for a small portion of streams in the field, on a site-specific basis during project development, and through random sampling. This information will be used to gauge confidence limits in the updated hydrography theme.

Appendix 8 displays water rights statistics for the S. F. Alsea watershed collected from the State of Oregon Water Resources Department. Approximately 18.5 cfs of streamflow in the S. F. Alsea is currently available (prioritized by date of application for the right) for withdrawal and

use for irrigation. This is 2.8 times the measured flow near the mouth of S. F. Alsea River during base flow on 9/29/94. If water rights holders are actually withdrawing and utilizing their currently allocated shares during this period, it may indicate a serious risk to water quality exists for other designated uses at this time (i.e., freshwater fisheries, domestic use).

***Stream Function:*** **Figure 9** displays some basic subwatershed statistics (see Appendix 9 for additional statistics). The S. F. Alsea watershed has an area of 63 sq. miles; subwatersheds range in size from 14.8 sq. miles in the Upper S. F. Alsea to 2.9 sq. miles in the Tobe Creek subwatershed. Stream densities are highest in Rock Creek and Tobe Creek (8.4 and 8.3 miles/sq. mile, respectively); both narrow, elongated stream basins cut into marine basalt. Road densities and the number of road crossings per mile of stream (*Appendix 9*) are highest in the lower S.F. Alsea subwatershed and lowest in the Tobe Creek subwatershed. The Lower S. F. Alsea subwatershed is also the only subwatershed with greater road density than stream density (5.4 mile/sq-mile).

These statistics imply that the subwatersheds with the highest levels of risk due to human infrastructure and resource management are the Upper, Middle and Lower S. F. Alsea, Bummer Creek, and Peak Creek. Rock Creek and Tobe Creek are at relatively lower risk.

During the summer of 1994 surveys to evaluate the condition of in-stream channel conditions as well as riparian vegetation conditions were conducted in three subwatersheds (Peak Creek, Rock Creek, and Tobe Creek) of the S. F. Alsea watershed (Appendix 10). Recommendations forthcoming from these surveys are included under the Management Opportunities section of this report. The following is a discussion of these conditions by subwatershed:

***<u>Peak Creek</u>*** Peak Creek appears to be the most heavily impacted subwatershed in the S. F.

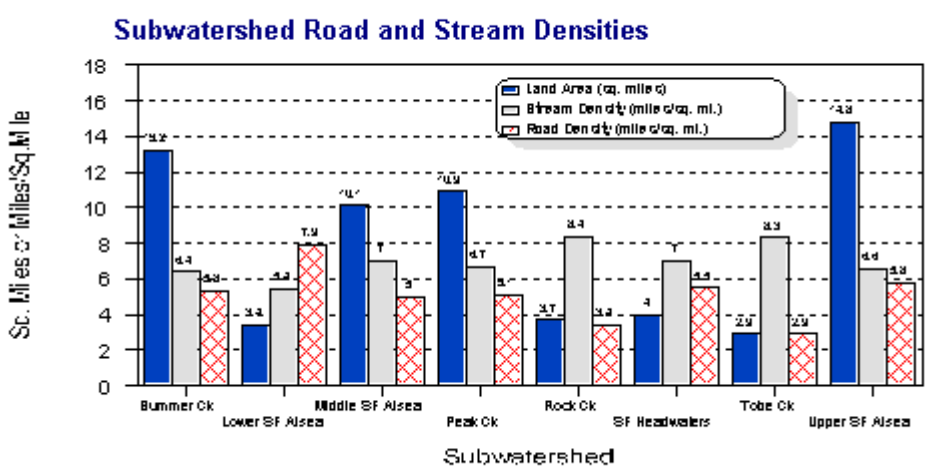


**Figure 9** Comparison of relative road and stream densities to the total land area in each subwatershed.

Alsea basin. Channel and riparian condition, especially in the fifth order lower reaches, is generally poor. While some intact, older conifer-hardwood mixed forest remains along the BLM-administered sections of 5PEAK001 and 002, the private land adjacent to these reaches is dominated by young Douglas fir plantations and red alder. Potential for long term LWD recruitment along these reaches is currently poor. The channel on these reaches is deeply incised to bedrock. These reaches are devoid of beaver dams despite the excellent habitat. Immediately upstream, reaches 4ROCK001B and 002 have extensive beaver dams. In-channel LWD ratios are extremely low (under 5 pieces/100 meters) while the flood plain contains a large number of conifer logs orientated parallel to the channel, implying that some sort of large flow event has scoured the channel and deposited the remaining conifer boles on the banks. Although this survey did not quantify fish habitat conditions, these reaches appear to offer very little potential for fish survival. A coincident fish habitat survey (summer 1994) by ODFW on portions of lower Peak Creek will provide more information when it is available in the spring of 1995.

The remaining fourth order channels on BLM-administered land were surveyed and appear (with the exception of 4ROCK001A) to be functional with moderate to high LWD ratios, stable channels, and fairly intact riparian stands. Reach 4ROCK001A has an intact, older conifer-hardwood mixed riparian but in-channel structure is poor and stream function appears to be somewhat compromised as evidenced by an entrenched channel and bank erosion. This subreach may be adjusting to channel conditions in the lower reaches of Rock Creek. The trend is considered upward because of the potential for long term LWD recruitment and the potential for increased beaver activity from 4ROCK001B. Fourth order channels on private land were not surveyed. No third order or lower channels were surveyed or observed during this inventory.

Additional stream surveys in the watershed include a 1985 fish habitat study conducted by BLM personnel in the Upper S. F. Alsea subwatershed (House 1986). The survey identified several sections of stream with degraded channel and/or riparian vegetation conditions and proposed several projects to correct these deficiencies. See Fisheries section of this report for further information.

A 1994 road survey (see Roads section) indicates that road condition on public lands throughout the S. F. Alsea watershed is generally good and risks to stream channel condition and water quality are low. Recent slope failure and debris torrent activity related to roads and capable of affecting stream function was not observed during the 1994 stream/riparian survey.

***Rock Creek*** Overall, Rock Creek appears to be in functional condition (with the exception of 4ROCK002, and lower portions of 3ROCK008, and 3ROCK006). Approximately 1.5 miles of 5ROCK001 and 4ROCK001 have an intact, older conifer-hardwood mix forest in the riparian zone supporting several hundred very large western red cedar. These cedar remain both as a remnant of the dominant stand or as downed logs in or across the stream channel. Beneath the dominant cedar is an intermediate aged stand of hemlock and cedar with occasional Douglas fir. The understory supports bigleaf maple, scattered red alder, and various shrub species. In-stream data implies that streamflow and channel roughness elements are in balance and stable. ODF&W micro-habitat survey data (collected in summer of 1994) will provide additional evidence concerning habitat conditions when it is released in the spring of 1995.

Reach 4ROCK002, and portions of 3ROCK008 and 3ROCK006 are functioning at risk with an unapparent trend. This portion of Rock Creek is deeply entrenched to bedrock and almost devoid of any large woody debris. The riparian vegetation along these reaches was recently clear cut and is now dominated by salmonberry and blackberry, red alder, and several wetland indicator species. Flood plain LWD is also completely depleted (probably removed during the recent clear cut). It is interesting to note that beaver dam building activity in these reaches is tremendous (as frequent as one dam every 20 meters) and far surpasses any other reach in the watershed. Beaver dams may have mitigated the loss of flood control normally provided by LWD. Nevertheless, evidence of stream downcutting (highly entrenched streams with low sinuosity, bedrock control, eroding banks) supports the hypothesis that these reaches had already adjusted to the removal of LWD by downcutting to bedrock before beaver dam building could compensate.

***Tobe Creek:*** Overall, Tobe Creek appears to be in good condition throughout with the exception of the lower reaches (especially below the culvert). The 1994 installation of in-stream structures along these reaches is expected to improve channel conditions to functional levels and to recover salmonid spawning and rearing habitat over time. Restoration of riparian vegetation along this reach is also a high priority. Fish habitat quality has likely been affected by road encroachment and removal of cedar from the riparian zone in stream reaches below the waterfall.

***Analysis of Large Woody Debris Recruitment Potential:*** Fish-bearing streams in the S.F. Alsea watershed were analyzed for LWD recruitment potential from riparian vegetation. Where in-channel LWD data was available, these were also used to assess current potential (see Appendix 6 for objectives, assumptions and confidence). Figures 10 and 11 display kilometers of stream by low, moderate, and high LWD recruitment potentials for all streams and BLM-administered streams, respectively (data is displayed in Appendix 11). Streams with low potential typically are hardwood dominated and have few if any Map 10 displays fish-bearing streams with varying levels of potential for LWD recruitment.

Approximately 105 km (33%) of fish-bearing streams in the S. F. Alsea watershed have low LWD potential; 481 km (15%) have moderate potential; and 165 km (52%) have high potential for LWD recruitment potential. This represents 46% of the total stream length in the S. F. Alsea

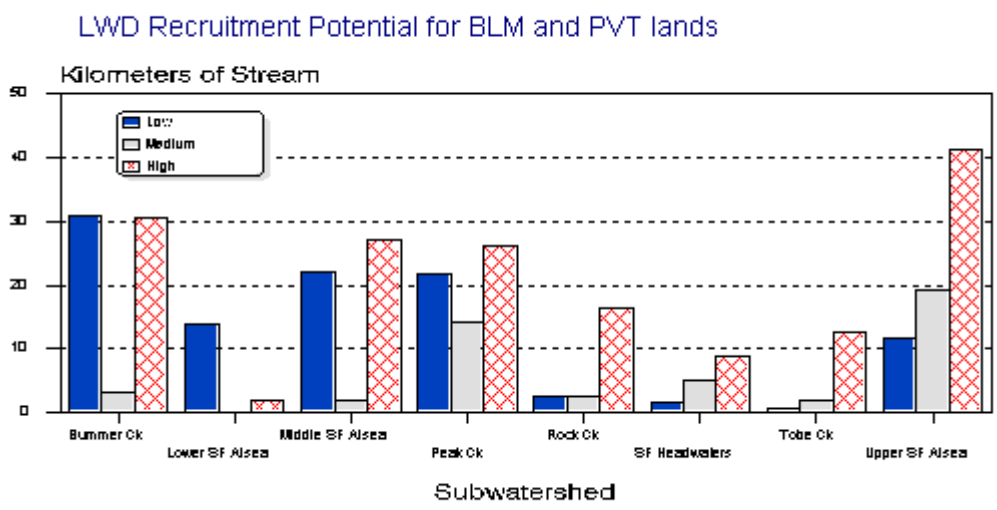


**Figure 10** Large woody debris recruitment potential by subwatershed. Stream portions with low potential have the greatest need for riparian and stream restoration.

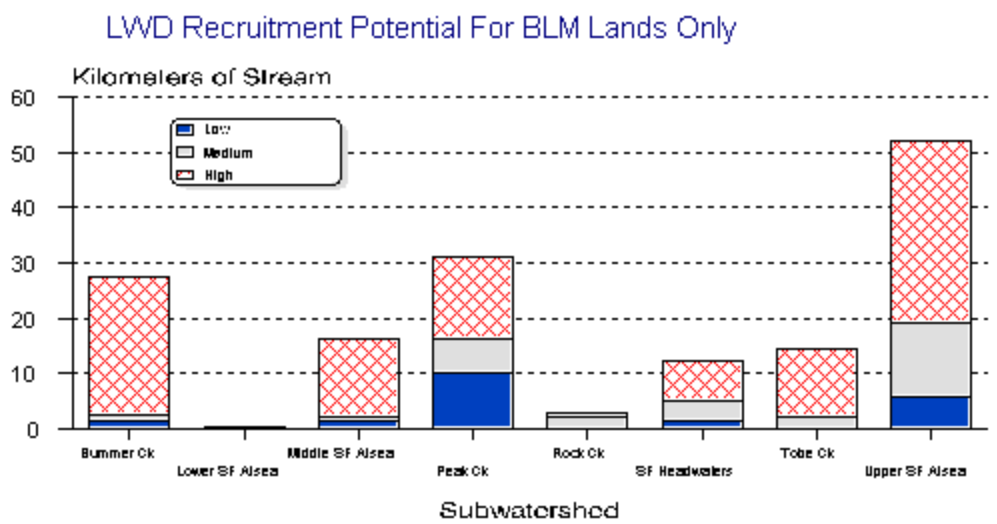


**Figure 11** Large woody debris recruitment potential along stream portions on BLM managed land. Greatest restoration potential is along Peak Ck.. and Upper SF Alsea.

watershed. Of this total, the BLM manages 20 km (19%) of stream with low potential, 29 km (60%) with moderate potential, and 123 km (75%) with high potential.

About 96% of the low potential stream segments are in five subwatersheds: Bummer Creek with 30.8 km (33% of the stream mileage in this subwatershed); Middle S. F. Alsea with 22.1 km (43%); Peak Creek with 21.8 km (35%); Lower S. F. Alsea with 14 km (88%); and Upper S. F. Alsea with 11.6 km (16%). Of this, about 18.5 km (18%) are managed by BLM.

Map 10 indicates that the majority of uninterrupted low potential streams are located in the lower portions of Bummer Creek and Lower S. F. Alsea subwatersheds on private lands (most likely agricultural areas). Although the lack of in-channel data on these streams reduces the confidence in this analysis, random field checks of these channels support the conclusion that channel structure is lacking.

Stream segments with low LWD recruitment potential should be investigated in the field by appropriate personnel to assess the potential for in-channel and riparian restoration projects.

***Assessment of LWD Recruitment Potential Along Headwater Streams:*** First and second order streams were assessed for LWD recruitment potential and delivery to downstream depositional reaches (see Hydrology analysis process in the appendix). **Figure 12** lists kilometers of headwater streams (private and BLM lands combined) for LWD recruitment potential levels by subwatershed; **Figure 13** shows this data for BLM-administered lands only (*Appendix 12*). ***Map 11*** displays this information and also shows the relationship of LWD potential to landslide potential.

In the S. F. Alsea basin, approximately 83 km (16%) of first and second order streams (BLM and private combined) have low potential for LWD recruitment. About 71 km (86%) of the low

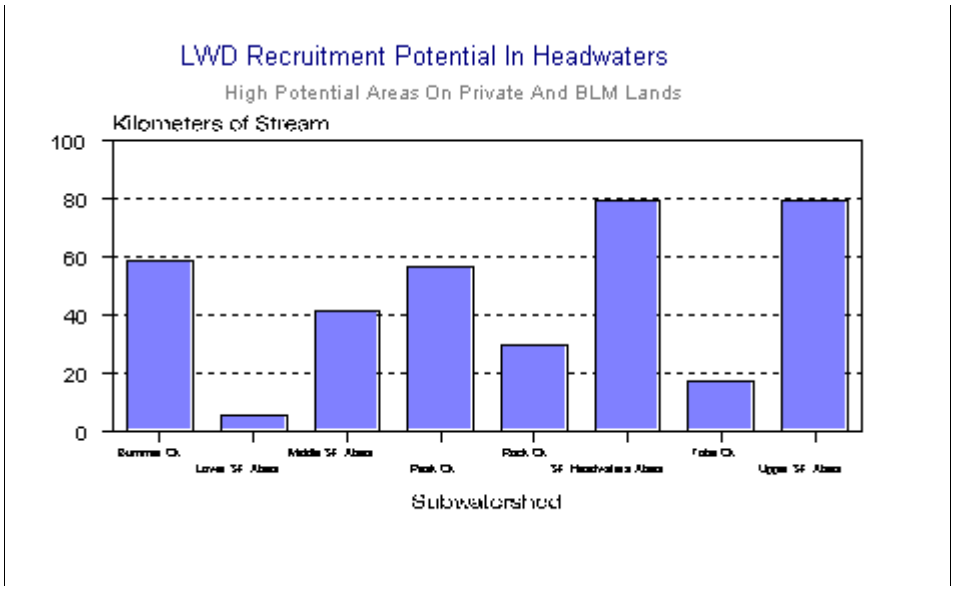


**Figure 12** Large woody debris recruitment potential in 1st and 2nd order (headwater) streams.

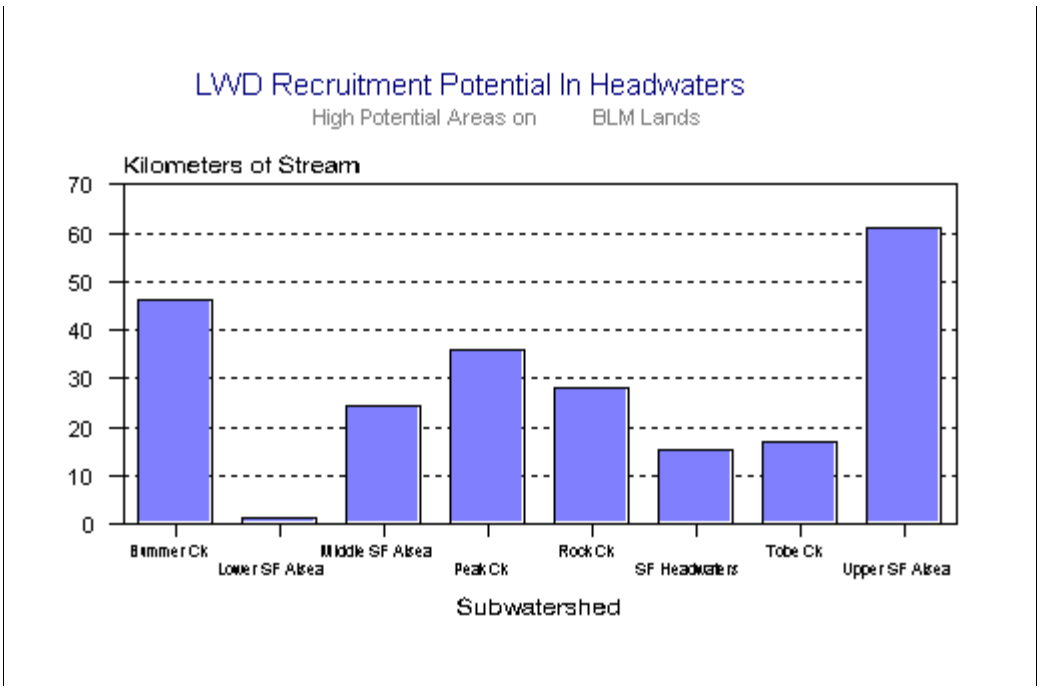


**Figure 13** Subwatersheds highest potential for large woody debris recruitment on BLM managed land.

potential streams are in four subwatersheds: Middle S. F. Alsea with 25.1 km (30% of the first and second order streams); Bummer Creek with 19.9 km (20%); Upper S. F. Alsea with 13.4 km (11%); and Peak Creek with 12.6 km (14%). Approximately 22 km (27% of BLM and private combined) of the low potential stream segments are on BLM-administered land.

Low potential stream segments on BLM are candidates for management intervention to improve riparian stand characteristics for improved LWD recruitment potential.

**Desired Future Conditions and Trends**

- The desired future conditions for streams and riparian zones on public lands in Western Oregon are regulated by federal law. Under The Clean Water Act, the BLM is required to meet or exceed all of the relevant water quality standards as set by the State of Oregon. These standards are designed to assess the condition and trends of all state waters. The ROD also specifies desired future condition objectives for streams and riparian zones on public lands in Western Oregon under the Aquatic Conservation Strategy. These objectives are designed to protect or restore the physical, chemical, and biological integrity of waters of the United States. Future anticipated conditions as a result of the implementation of the Salem District ROD are discussed in that document.

**Management Opportunities:**

- Some surveyed stream reaches on public and private land currently have low LWD recruitment potential (Map 11) due to removal of streamside vegetation. Functions provided by LWD have been partially supplemented, in places, by beaver dam construction; nevertheless, long-term potential for replacement of in-stream LWD is low. Management actions are necessary to promote the growth of large, older conifers in riparian zones with low LWD recruitment potential . High priority reaches for riparian enchancement improvement by ownership include: BLM (4TOBE001 & 4PEAK003) and private (4ROCK002A, 5PEAK900A&B, 5PEAK001A-E).

- High priority for in-stream channel enhancement includes the entire fifth-order channel of Peak Creek. This channel is very low in amounts of LWD. Contact with private land owners should be initiated and appropriate strategies discussed. Strategies may include allowing beaver populations to reestablish in these reaches or placement of structures in the channel.

- Rock Creek has low to moderate potential for structural improvements on the lower portion of the unsurveyed third order channel (3ROCK008). This reach has a deeply incised channel, most likely a result of channel changes in 4ROCK002B. Channel structure projects on lower Tobe Creek have already been initiated.

- Several reaches in Tobe and Peak Creek are dominated by beaver. Dam building in these reaches has resulted in the creation of wetlands, coterminous with the stream, which contain diverse habitats for fish, wildlife, and plants (terrestrial and aquatic). The following sub-reaches should be noted and inventoried by the appropriate personnel: 4TOBE004D, 4ROCK002B, 4PEAK001B, 4PEAK002 and 4PEAK003A.

- There appears to have been little or no human activity or disturbance on BLM lands adjacent to 5ROCK001 and 4ROCK001 and therefore, this portion of Rock Creek offers an exceptional example of stream and riparian processes under "natural" conditions. This section of Rock Creek should be recognized for its reference quality and as a prime example of an unmanaged riparian ecosystem in this region.

**Data Gaps:**

- Accurate hydrography and topographic themes should be developed. Meanwhile, confidence in our current updated hydrography theme should be assessed.

- LANDSAT data characterization of vegetation should be improved for future GIS analysis applications.

- The unsurveyed streams in the S. F. Alsea watershed (primarily 1-3 order or streams on private lands) should be stratified and proportionally surveyed to serve as a baseline for extrapolation.

- High risk roads in the S. F. Alsea, on both BLM and private lands, need to be identified (currently underway in Transportation Management Plan process). Once identified, these roads can either be improved or closed.

- Modeling of flow in the S. F. Alsea watershed should be initiated.

- As a result of time constraints, no attempt was made in the current analysis to expand upon hydrologic, stream channel or aquatic conditions on a site-specific basis. This is a high priority data gap.

**Monitoring Needs:**

- Prioritized candidates for stream temperature monitoring during summer base flow include: Tobe Creek, Lower S. F. Alsea River, Lower Bummer Creek, Peak Creek, and Rock Creek.

- Prioritized candidates for turbidity monitoring for point sources of sediment include: Peak Creek, Bummer Creek, tributaries to the Lower and Middle S. F. Alsea River, and tributaries to the Upper S. F. Alsea River.

- A road monitoring program with visits to high risk road sections during storm events should be implemented.

- Portions of Rock Creek should be surveyed to serve as a reference stream or control for extrapolation and comparison to other coastal streams in this type of geomorphology. This includes inventorying the unsurveyed stream orders with emphasis on LWD loadings, channel substrate, mass wasting processes, and fish habitat/use.

- A historical review of mass wasting activity and stream channel changes in the S. F. Alsea watershed should be initiated using aerial photos. Headwall areas with high mass failure and/or debris flow potential should be monitored to provide an understanding of the processes linking the high gradient, eroding reaches with low gradient, depositional reaches.

- Additional monitoring for macro invertebrate populations, DO, conductance, and flow should occur throughout the watershed to establish base lines for these parameters.

- Trends analysis for stream and riparian conditions on a site specific basis should be completed.

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# ISSUE: FISHERIES HABITAT

**Key Questions:**

- *What are the current conditions of the habitat of anadromous fish species and resident fish species compared with the desired future conditions within the watershed?*
- *Is there evidence that fish habitat conditions have changed from historic conditions?*
- *Where have management activities and natural processes reduced the large wood supply below natural levels?*
- *What can be done to adequately protect and restore riparian areas?*
- *What can be done to restore degraded/declining habitats of anadromous and resident fish species?*

**Background:**

Numerous native anadromous salmon and trout stocks in the Pacific Northwest are considered to be threatened and declining and may be at risk of extinction. Coastal steelhead and coho salmon, including those found in the South Fork Alsea River drainage, have been petitioned for federal listing under the Endangered Species Act. Factors affecting the regional decline of salmonids include: farming, the use of pesticides and fertilizers, ocean conditions, log jam removal (stream cleaning), logging of streamside vegetation, landslides, fish hatcheries, major flood events, splash dams, and power dams. Some of these factors are beyond the control of land management agencies to effect any improvements in salmonid abundance.

Habitat for anadromous and resident fish species, and other aquatic species is degraded and/or declining in many areas of the Pacific Northwest as a result of the factors listed above. Typical habitat problems include excessive stream sedimentation, lack of large woody debris, lack of quality pools and spawning gravels, reduced stream flows, and elevated water temperatures. Similar to the regional situation, reductions in habitat conditions have also occurred in the S. F. Alsea watershed.

It is widely recognized that propagation of anadromous fisheries is a major beneficial use of water resources in the Pacific Northwest. Life stages affected by water quality include: spawning, summer rearing, out migration of anadromous fish, survival of eggs/alevins, overwintering, and returning spawners.

**Present Conditions:**

**Fisheries:** Anadromous fish species present in the S. F. Alsea River system include: fall chinook salmon (*Oncorhynchus tshawytscha*), coho salmon (*O. kisutch*), winter steelhead (*O. mykiss*), and coastal cutthroat trout (*Salvelinus clarki*) (see Appendix 13). The distribution of salmon (coho and chinook) and steelhead/cutthroat trout is displayed in Maps 12 and 13, respectively. Seasonal migrations result in year-round usage of the watershed by adult anadromous salmonids. There are three known natural barriers which have affected anadromous fish distribution within the watershed. These include: S.F. Alsea Falls (T14S R7W, Sec.26), Green Peak Falls (T14S, R7W, Sec.23), and Tobe Creek Falls (T14S, R7W, Sec.30). Anadromous fish are found in approximately 100 miles of stream within the watershed.

Resident cutthroat trout populations are found throughout the watershed, including above barriers to anadromous fish and second order streams. They are found in approximately 170 miles of streams within the watershed. Other freshwater species occurring the S. F. Alsea watershed include lamprey, dace, and sculpins. Crayfish are also found in the basin.

The S. F. Alsea River has been greatly influenced by two hatcheries in the Alsea River system; the Fall Creek Hatchery that releases salmon, and the North Fork Hatchery which releases steelhead and trout.

Fall chinook salmon (adult) generally appear in the S. F. Alsea River around the first part of October (depending on river conditions) and run through November. Fall chinook salmon inhabit approximately 13.2 miles of stream within the watershed. Fall chinook are found mostly in the mainstem of the S. F. Alsea River and its major tributaries. Tobe Creek Falls and Green Peak Falls do not appear to affect this species, because the preferred habitat lies below these barriers. Habitat requirements include large beds of spawning gravels in mainstem and major tributaries, and large deep pools for resting and juvenile rearing. Most juvenile chinook leave the stream and rear in estuaries.

Coho salmon (adult) usually appear in two runs. The first run starting in October and ending in late November is mostly of hatchery origin. The second run starting in early December and ending in early February is mostly wild stock. Coho salmon inhabit approximately 47 miles of stream within the watershed. All major streams have some available habitat for coho salmon. The distribution of coho salmon is limited by falls in three subwatersheds; Tobe Creek, Peak Creek, and upper S. F. Alsea River. Habitat requirements of this species are clean spawning gravels in low to medium gradient mainstems and tributaries; rearing habitat is primarily in dammed pools and backwaters; and coho depend on good instream structure and cover. The coastal coho salmon is proposed for federal listing (as a threatened species) under the Endangered Species Act (ESA).

Winter steelhead follow a similar pattern as the coho salmon, with early hatchery runs entering the river in mid-December to mid-March while the later "wild stock"runs from March to April. Winter steelhead inhabit approximately 31.5 miles of stream within the drainage. Winter steelhead have a varied spawning distribution, from mainstem to the smallest accessible

tributaries including high gradient streams. The distribution of winter steelhead trout is similar to coho salmon. Winter steelhead fry rear primarily in riffles and juvenile winter steelhead usually rear in riffles and well-oxygenated pools. Adult steelhead require suitable gravel beds for spawning, but relatively deep water with cover for holding and resting. Coastal winter steelhead are also a proposed species for federal listing under the ESA.

Sea-run cutthroat trout appear in the river possibly as early as late August and run to late April (depending on river conditions). Resident cutthroat trout are the only indigenous salmonid above the falls and are assumed to be present in nearly all perennial and some intermittent streams. Cutthroat trout spawn in low to medium gradient tributaries in relatively fine gravels. Sea-run cutthroat trout (adults) rest in pools and relatively deep slots. Cutthroat trout (fry) rear primarily in riffles and small pools. Juvenile cutthroat trout rear in small and large pools; and all cutthroat trout depend on good instream structure and heavy cover.

**Habitat Conditions:** Removal of old growth in riparian zones during the past 30 to 40 years resulted in the greatest adverse impact on fish habitat (House 1986). Studies have shown that streamside vegetation removal during timber harvest unfavorably alters crucial fish habitat (Gibbons and Salo 1973; Moring and Lantz 1974). Prior to events such as streamside logging, road construction, flood events, and stream cleaning, the stream habitats were likely healthier within the watershed.

Fish habitat in the drainage primarily occurs in second through sixth order streams. First order streams provide some seasonal habitat, but are usually dry in the summer months; second order streams are assumed to be fish bearing on the coast. Crucial fish habitat occurs on portions of the main stem South Fork Alsea and most of its major tributaries. Stream gradients in the drainage are moderate to steep.

Total miles of fish habitat on BLM-administered lands in the watershed are shown in Appendix 14. Miles of fish habitat were estimated using BLM forest type maps as well as BLM and ODFW fish distribution maps and stream surveys. Fish habitat was also classified by stream order.

The condition of fish habitat was evaluated by use of stream survey data collected during the late 1970's and early 1980's. More recent habitat data is not available. These older data provided only generalized ratings of "excellent, good, fair or poor" habitat conditions based on a subjective scoring system. Appendix 15 displays stream habitat evaluations estimated for subwatersheds based on survey data. Data are listed for specific reaches of streams within the subwatersheds.

The following is a brief discussion of habitat conditions and fish use in the various subwatersheds.

Summary fish habitat statistics for these subwatersheds are displayed in Appendix 15.

*Bummer Creek*: Bummer Creek subwatershed covers approximately 8,461 acres and is dominated by private land owners. It has 83.9 miles of stream with 39.2 miles used by fish;

BLM manages about 42.7 miles of stream. Swamp Creek, Brown Creek, Record Creek and Wilson Creek are major tributaries of Bummer Creek. Bummer Creek is a fifth order stream used by coho salmon, steelhead, and cutthroat trout. Bummer Creek was surveyed by the BLM during the summer of 1980 in order to evaluate stream habitat conditions.

Swamp Creek, a major 4th order tributary to Bummer Creek used by coho salmon, steelhead and cutthroat trout, was surveyed by ODFW during the summer of 1993 but only on lands owned by Starker Forests, Inc. This data was collected following established protocols (Methods For Stream Habitat Surveys: Oregon Department of Fish and Wildlife, Aquatic Inventory Project, Version 3.1).

The East Fork (E.F.) Swamp Creek survey began at the confluence of Swamp Creek and Brown Creek in the SE 1/4 of Sec 26, T14S, R8W and continued 260 meters upstream to the confluence of E. F. Swamp Creek and Swamp Creek. The E. F. Swamp Creek survey continued from the confluence of West Fork (W.F.) Swamp Creek and Swamp Creek in the NE 1/4 of Sec 35, T14S, R8W and proceeded upstream another 1,468 meters to the survey conclusion in the SW 1/4 of Sec 36, T14S, R8W. The total surveyed distance was 1,728 meters. On a scale of 1-5, the average complexity score for large woody debris (LWD) in the stream was 1.2. This figure indicates that very little LWD was present. The overall stream gradient was 3.5%, with a moderately high incidence of undercut banks. Stream bank stability was fair. The most frequently occurring substrate was silt/organics. Trees in the riparian zone included a mixture of 62% hardwoods and 38% conifers in the 3-90 centimeter diameter range. Beaver activity and dams were common. Fish were commonly observed.

Two tributaries of E. F. Swamp Creek were also surveyed:

The E. F. Swamp Creek tributary #2 survey began at the confluence of E. F. Swamp Creek tributary #2 and E. F. Swamp Creek in the NW1/4 of Sec 36, T14S, R8W, and continued 63 meters upstream to its conclusion at a culvert crossing on Starker Forest Road #4100. On a scale of 1-5, the average complexity score for LWD in the stream was low at 1.0. This figure indicates that very little LWD was present. The stream gradient was 4.1% with no undercut banks. Stream bank stability was high with no active erosion. The most frequently occurring substrate was silt/organics. Trees in the riparian zone included a mixture of 58% conifers and 42% hardwoods in the 3-50 centimeter diameter range.

The E. F. Swamp Creek tributary #3 survey began at the confluence of E. F. Swamp Creek tributary #3 and E. F. Swamp Creek in the SW1/4 of Sec 36, T14S, R8W and continued 200 meters upstream to its conclusion near a Starker Forest Road. On scale of 1-5, the average complexity score for LWD in the stream was low at 1.1. This figure indicates that very little LWD was present. The stream gradient was 5.5%, with a moderate incidence of undercut banks. Streambank stability was low with 21% of the banks actively eroding. The most frequently occurring substrate was silt/organics. Trees in the riparian zone were dominated by conifers (90%) in the 3-30 centimeter diameter range.

Record Creek is a third order tributary to Bummer Creek and is used by resident cutthroat and

sculpins. Record Creek stream habitat surveys were conducted during the summer of 1980 on second through fourth order streams.

*Lower S.F. Alsea*: Lower S.F. Alsea River subwatershed covers approximately 2,170 acres of mixed ownership and 19.5 miles of stream; BLM manages about 0.9 miles of stream. Little is known about this subwatershed. It is assumed that the Lower S.F. Alsea River subwatershed is used by all fish species listed for the watershed and has about 8.8 miles of stream usable by fish. Headrick Creek is the only major tributary to the Lower S.F. Alsea and it is a fourth order stream.

*Middle S. F. Alsea:* Middle S. F. Alsea subwatershed covers approximately 6,455 acres and 70.3 stream miles; BLM manages about 31.3 miles of stream. There are 18.4 miles of stream used by fish in this watershed. This watershed has four major tributaries which include: Trout Creek (fifth order), Dubuque Creek (fourth order), and two unnamed third order streams.

*Peak Creek:* This subwatershed has approximately 7,021 acres and is dominated by private land owners. There are about 73.2 stream miles with BLM managing about 36.1 miles. Peak Creek is a fifth order stream used by coho salmon, steelhead and cutthroat trout. Peak Creek has a natural barrier to fish migration located less than one mile from its confluence. This falls known as the Green Peak Falls is located in T14S, R7W, Sec.23 and is approximately 80 feet high. Anadromous fish can access approximately 0.8 miles of stream and resident fish about 32.2 miles. Peak Creek has high potential for fisheries. Stream habitat and riparian surveys indicate that Peak Creek is in poor to fair condition (*Appendix 15*). Peak Creek is also known for its high input of sediment to the S.F. Alsea River.

*Rock Creek:* Rock Creek subwatershed is approximately 2,408 acres and is dominated by public lands. The BLM manages approximately 27.8 miles of stream out of a total 31.2 miles in the drainage. Rock Creek is a fifth order stream that is used by coho salmon, steelhead, cutthroat trout and some occasional chinook when the flows are favorable. About 13.3 miles of Rock Creek are used by fish. Fish habitat in the Rock Creek drainage was surveyed during the summer of 1980 and riparian surveys were conducted during the summer of 1994. Rock Creek is considered close to pristine conditions , considering the condition of most subwatersheds in the S. F. Alsea watershed (see *Appendix 15*).

*Tobe Creek:* Tobe Creek is the smallest subwatershed (1,873 acres) tributary to the S. F. Alsea River; it is dominated by BLM-administered lands. The BLM manages approximately 24.4 miles of stream in the drainage with the lower portion (0.9 miles) of the drainage owned by Starker Forests Inc. BLM has established a cooperative agreement to manage fish habitat on Starker owned lands. Tobe Creek is a fourth order stream that is used by four species of fish: fall chinook (occasional use when weather conditions are favorable), coho salmon, winter steelhead, and cutthroat trout. Tobe Creek is identified as a Tier 1 Key Watershed in the ROD, meaning it is considered crucial for maintaining and recovering habitat for at-risk stocks of anadromous fish. Tobe Creek has only 2.2 miles of habitat accessible to anadromous fisheries due to the existence of a falls approximately three meters high. Though the watershed itself is in good condition (see *Appendix 15*), the fisheries habitat in the main reaches of Tobe Creek have been modified by past harvesting adjacent to the stream and by stream cleaning activities. Tobe Creek also had

successful fish habitat restoration projects completed in the summer of 1982 and 1994. In 1982, 20+ wire gabion structures were placed in Tobe Creek. In 1994, 26 in-stream structures (logs and boulders) and two off-channel alcoves were constructed in Tobe Creek.

*Upper S. F. Alsea River:* This subwatershed covers approximately 9,450 acres and 98.4 miles of stream; BLM manages about 70.3 miles of stream. The Upper S.F. Alsea has about 44.6 miles of stream used by fish. Alsea Falls on the Upper S.F. Alsea is a barrier to all anadromous fish. This subwatershed includes seven major tributaries which include: Fall Creek, Coho Creek, Chris Creek, Williams Creek, Eric Creek, and Jeremy Creek. This subwatershed was inventoried in the 1980's which covered 5.8 miles of stream starting at the South Fork Alsea River Falls and ending at the Eugene BLM District boundary.

Several findings surfaced from the evaluations of the inventory conducted in the 1980's. The inventory showed that the watershed contains excellent summer and winter rearing habitat for coho salmon. The spawning gravels, although essentially absent from the mainstem S. F. Alsea River, are found in sufficient amounts throughout the remainder of the drainage to provide adequate spawning for coho salmon and steelhead trout. However, there are limited amounts of gravel in the mainstem to support chinook salmon. The inventory also showed that past management activities have essentially removed the old-growth riparian zone plant community along most of the mainstem and its tributaries. As a result, the riparian zone consists mostly of young stands of willow and red alder, eliminating the possibility of recruitment of large woody debris in the near future. Additional habitat information for this subwatershed is available in House (1986).

*S.F. Alsea Headwaters:* S.F. Alsea Headwaters is located in the Eugene BLM District and there is no habitat data available at this time. This watershed has approximately 3,537 acres and 27.8 miles of stream; BLM manages about 19.4 miles of stream. Approximately 9.7 miles of stream are used by fish (assuming that third order and higher streams have fish present).

**Desired Future Conditions:**

***Fish Habitat***

- Watershed conditions will be leading toward the recovery of stocks at-risk, sensitive species and other depressed stocks of anadromous and resident fish. The peak spawning count goals for adult coho salmon and steelhead will be achieved by the Oregon Department of Fish and Wildlife.

- A productive stream ecosystem for mixed salmonid communities which contain a broad diversity and complexity of fish habitat features. Cover features such as large woody debris, boulders, overhanging vegetation and deep water are abundant in all reaches and channels are free of all unnatural obstructions that interfere with the upstream and downstream movements of adult and juvenile salmonid. Spawning gravels contain low percentages of fine sediments.

- Large woody debris in forested reaches meets or exceeds the standard of 80 pieces per mile,

>24 inch minimum diameter and >50 feet in length.

- Pool frequency (pools/mile) and quality meet goals based on stream size. In larger streams, quality pools are greater than three feet in depth.

- Vegetation along perennial and intermittent streams provides shade, nutrients, large organic debris and a buffer from potential impacts from management activities

- General guidelines for Riparian Reserve widths are achieved (as described in the Aquatic Conservation Strategy of the Standards and Guideline-ROD, 1994)

- The physical integrity of the aquatic system, including shorelines, stream banks and stream channel configurations is within the range of natural variability.

- Landslide rates, quantities and composition of landslide materials are within the range of natural variability for the watershed.

***Water***

- Meets or exceed all applicable state water quality standards, especially the standard for stream temperature, dissolved oxygen concentration, fecal coliform and turbidity.

- Water quantity and quality supports identified existing and potential beneficial uses.

- Summer water temperatures from upper basin tributary streams are low enough that temperatures in the mainstem are acceptable for holding habitat .

**Data Gaps:**

- Current fish habitat data on public lands. Most of the existing fish habitat inventory available is from the early 1980's and only from the upper S.F. Alsea River, Tobe Creek, Peak Creek, and Rock Creek subwatersheds. All surveys completed prior to 1990 should be repeated, with priority given to streams with no data.

- Fish habitat data on private lands. These data are needed so that we can accurately assess management opportunities for fish habitat in the drainage. It is probable that a large percent of fish habitat impacts exist on private lands.

- Fish species distribution.

- Trend data for fish numbers throughout the watershed.

**Management Opportunities:**

- Known habitat expansion opportunities are limited to laddering natural falls. Although habitat

improvement projects are technically feasible in the drainage, many are of low priority because of steep stream gradients and limited spawning potential. Opportunities for anadromous fish projects in Bummer Creek, Peak Creek, Lower S.F. Alsea and Middle S. F. Alsea subwatersheds are limited because they are largely in private ownership. Cooperative projects with these land owners could be pursued.

- Expand fish habitat inventories to entire watershed.

- Update stream habitat inventories throughout the drainage.

**Monitoring Needs:**

- Continue fish escapement monitoring counts on Tobe Creek.

- Monitor fish enhancement project on Tobe Creek.

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# ISSUE: RIPARIAN RESERVES

- ***Key Question: What are the management opportunities in Riparian Reserves?***

**Background**:

Riparian Reserves are a key component of the Aquatic Conservation Strategy as described in the ROD. Within these Reserves, riparian-dependent resources receive primary emphasis. Standards and guidelines prohibit and regulate activities in Riparian Reserves that retard or prevent attainment of Aquatic Conservation Strategy objectives. This strategy was developed to restore and maintain the ecological health of watersheds and aquatic ecosystems contained within them on public lands. Nine Aquatic Conservation Strategy objectives were identified in the ROD as follows:

1) *Maintain and restore the distribution, diversity, and complexity of watershed and landscape-scale features to ensure protection of the aquatic systems to which species, populations and communities are uniquely adapted.*

2) *Maintain and restore spatial and temporal connectivity within and between watersheds. Lateral, longitudinal, and drainage network connections include flood plains, wetlands, upslope areas, headwater tributaries, and intact refugia. These network connections must provide chemically and physically unobstructed routes to areas critical for fulfilling life history requirements of aquatic and riparian-dependent species.*

3) *Maintain and restore the physical integrity of the aquatic system, including shorelines, banks, and bottom configurations.*

4) *Maintain and restore water quality necessary to support healthy riparian, aquatic, and wetland ecosystems. Water quality must remain within the range that maintains the biological, physical, and chemical integrity of the system and benefits survival, growth, reproduction, and migration of individuals composing aquatic and riparian communities.*

5) *Maintain and restore the sediment regime under which aquatic ecosystems evolved. Elements of the sediment regime include the timing, volume, rate, and character of sediment input, storage, and transport.*

6) *Maintain and restore in-stream flows sufficient to create and sustain riparian, aquatic, and wetland habitats and to retain patterns of sediment, nutrient, and wood routing. The timing, magnitude, duration, and spatial distribution of peak, high, and low flows must be protected.*

7) *Maintain and restore the timing, variability, and duration of flood plain inundation and water table elevation in meadows and wetlands.*

8) *Maintain and restore the species composition and structural diversity of plant communities in riparian areas and wetlands to provide adequate summer and winter thermal regulation, nutrient filtering, appropriate rates of surface erosion, bank erosion, and channel migration and to supply amounts and distributions of coarse woody debris sufficient to sustain physical complexity and stability.*

9) *Maintain and restore habitat to support well-distributed populations of native plant, invertebrate, and vertebrate riparian-dependent species.*

Standards and guidelines to achieve these objectives are listed in the ROD. Those guidelines relevant to timber management in Riparian Reserves are as follows:

*TM1) Prohibit timber harvest, including fuelwood cutting, in Riparian Reserves, except as described below. Riparian Reserve acres shall not be included in calculations of the timber base.*

a) *Where catastrophic events such as fire, flooding, volcanic, wind, or insect damage result in degraded riparian conditions, allow salvage and fuelwood cutting if required to attain Aquatic Conservation Strategy objectives.*

b) *Salvage trees only when watershed analysis determines that present and future coarse woody debris needs are met and other Aquatic Conservation Strategy objectives are not adversely affected.*

c) *Apply silvicultural practices for Riparian Reserves to control stocking, reestablish and manage stands, and acquire desired vegetation characteristics needed to attain Aquatic Conservation Strategy objectives.*

According to the ROD: "The important phrases in these standards and guidelines are 'meet Aquatic Conservation Strategy objectives,' 'does not retard or prevent attainment of Aquatic Conservation Strategy objectives' and 'attain Aquatic Conservation Strategy objectives.' These phrases, coupled with the phrase 'maintain and restore ' within each of the Aquatic Conservation Strategy objectives, define the context for agency review and implementation of management activities. Complying with the Aquatic Conservation Strategy objectives means that an agency must manage the riparian-dependent resources to maintain the existing condition or implement actions to restore conditions. The baseline from which to assess maintaining or restoring the condition is developed through a watershed analysis. Improvement relates to restoring biological and physical processes within their ranges of natural variability."

The ROD also states: "Post-watershed analysis Riparian Reserve boundaries for permanently-flowing streams should approximate the boundaries prescribed in these standards and guidelines. However, post-watershed analysis Riparian Reserve boundaries for intermittent streams may be different from the existing boundaries. The reason for the difference is the high variability of hydrologic, geomorphic and ecologic processes in a watershed affecting intermittent streams. At the same time, *any analysis of Riparian Reserve widths must also consider the contribution of these reserves to other, including terrestrial species. Watershed analysis should take into account all species that were intended to be benefited by the prescribed Riparian Reserve widths. Those species include fish, mollusks, amphibians, lichens, fungi, bryophytes, vascular plants, American marten, red tree voles, bats, marbled murrelets, and northern spotted owls.* [emphasis added] The specific issue for spotted owls is retention of adequate habitat conditions for dispersal." Furthermore, the ROD states "The prescribed widths of Riparian Reserves apply to all watersheds until watershed analysis is completed, a site-specific analysis is conducted and described, and the rationale for final Riparian Reserve boundaries is presented through the appropriate NEPA decision-making process."

The modification of Riparian Reserve widths is further elucidated in the ROD: "Watershed analysis is expected to yield the contextual information needed to define ecologically and geomorphically appropriate Riparian Reserves. Analysis of site-specific characteristics may warrant Riparian Reserves that are narrower or wider than the prescribed widths. Thus, it is possible to meet the objectives of at least the Aquatic Conservation Strategy portion of these standards and guidelines with post-watershed analysis reserve boundaries for intermittent streams that are quite different from those conforming to the prescribed widths. Regardless of stream type, changes to Riparian Reserves must be based on scientifically sound reasoning, and be fully justified and documented."

**Existing Conditions**

The ecosystem incorporated by the boundaries of SF Alsea watershed is generally in good condition. Compared to watersheds in the Mapleton District of the Siuslaw National Forest and adjacent watersheds, mass wasting and soil erosion generally have minor impacts to streams (see Soils section). Roads are generally well located and failures are infrequent. Although water quality data is largely unavailable for the basin, general observations suggest that water quality

may not be a major problem in the drainage compared to other watersheds (See Water Quality and Hydrology Section). Obvious problems in this drainage are primarily related to vegetation condition of some riparian zones (dominated by red alder or small, densely stocked conifers); in-stream channel condition of some stream segments where the scarcity of LWD has reduced the amount of pool habitat (see Water Quality and Hydrology section); lack of structural diversity in many young coniferous stands; lack of interior older forests; and excessive road densities (see Wildlife section).

The existing condition of Riparian Reserves was described in the Aquatic section in terms of LWD recruitment potential. LWD potential was based on the vegetative condition of the adjacent riparian zones. To summarize, about 48 percent of all fish-bearing streams (BLM and private) in the S.F. Alsea Watershed have low to moderate potential for LWD recruitment; about 96 percent of the low potential stream segments are in five subwatersheds: Bummer Creek; Middle S.F. Alsea; Peak Creek; Lower S.F. Alsea; and Upper S.F. Alsea. Sixteen percent of headwater streams (1st and 2nd order) in the S. F. Alsea watershed have low potential for LWD recruitment; about 86% of these low potential streams are in four subwatersheds: Middle S.F. Alsea; Bummer Creek; Upper S.F. Alsea; and Peak Creek.

The interim Riparain Reserve widths that apply in this watershed are 210 feet (one site potential tree) on intermittent and non-fish-bearing streams and 420 feet (two site potential trees) on all fish-bearing, permanent flowing streams and lakes. For analysis purposes, based on our best knowledge of actual conditions, we have assumed that all 2nd order and greater streams are perennial, with fish, and are given the maximum 420 foot width riparian reserve, and all 1st order streams are either intermittent or non-fish-bearing perennials and are given 210 foot widths. This results in approximately 14350 acres of riparian reserves in the S.F. Alsea watershed which is 63% of BLM ownership (see Map 14).

**Desired Future Conditions:**

- The desired future condition is to meet the Aquatic Conservation Strategy as delineated in the ROD and summarized above.

**Management Opportunities:**

- Complete stream surveys to determine perennial flow, functional condition, channel characteristics, fish presence, etc. in each subwatershed. Surveys are only completed on Tobe Ck., Rock Ck. and Peak Ck. to date.

- Determine appropriateness of interim Riparian Reserve widths and adjust accordingly. This was not done as part of this watershed analysis effort due to lack of data on various streams and lack of a scientifically credible process for determining necessary reserve widths. This relates especially to the needs of wildlife species that occur in, or are dependent on, riparian habitat. Efforts at regional and provincial level to determine a process for adjusting Riparian Reserve widths should be completed, and REO approved, before we suggest modifying widths in the S.F. Alsea watershed.

- Evaluate the approximately 1900 acres of heavily stocked Douglas-fir stands within Riparian Reserves that are suitable for thinning treatments to determine high priority stands for treatment. This will include stand exams and ID Team review of suitability based on field observations. It is expected that about 50% of these acres will be suitable and treatable as high priority stands to help improve riparian habitat conditions and meet the Aquatic Conservation Strategy (see Map 15 for potential treatment areas).

- Evaluate the approximately 2500 acres of dense, single story Douglas-fir stands within Riparian Reserves that are suitable for density management treatments to determine high priority stands for treatment. This will include stand exams and ID Team review of suitability based on field observations. It is expected that about 50% of these acres will be suitable and treatable as high priority stands to help attain old-growth forest conditions within LSR and to meet the Aquatic Conservation Strategy (see Map 16 for potential treatment areas).

Riparian stands dominated by hardwood trees and stands with densely stocked, small diameter conifers will be priority stands for treatment. Stands with adequate conifer structural condition to meet Aquatic Conservation Strategy objectives or stands with the current conifer structural condition on an improving trend, will be secondary sites. Any density management, thinning or gap creation within these latter stands will not reduce the conditions thought necessary to meet the Aquatic Conservation Strategy. Decisions to treat stands, timing and methods to be used and whether or not commercially valuable wood would be removed from the stands, will be based on site specific, interdisciplinary analysis and will be made as part of a proposed project environmental assessment process.

**Rationale:**

- According to the ROD, thinning (precommercial and commercial) within LSRs may occur in stands up to 80 years old regardless of the origin of the stands. The purpose of these silvicultural treatments is to benefit the creation and maintenance of late-successional forest conditions. Under the ROD, it is permissible to apply silvicultural practices for Riparian Reserves to control stocking, reestablish and manage stands, and acquire desired vegetative characteristics needed to attain Aquatic Conservation Strategy objectives.

- Some of the resource problems in this drainage include vegetation condition of some riparian zones (dominated by red alder or small, densely stocked conifers); in-stream channel condition of some stream segments where the scarcity of LWD has reduced the amount of pool habitat (see Water Quality and Hydrology section); and lack of structural diversity in many young coniferous stands. These problems can be partially addressed by proactive management practices in Riparian Reserves in the near term. The alternative method to improvement of these conditions is to allow natural succession to proceed uninfluenced by man. The time frame for improvement under this scenario could be much greater than the proactive management scenario.

**Data Gaps:**

- It is currently known that thinnings can produce larger conifer trees in an accelerated time period. However, whether the appropriate structural conditions of an old-growth-like forest can be created by thinning is another question, which researchers are currently attempting to answer. Research studies in the Salem and Eugene Districts of the BLM in conjunction with the National Biological Survey (and elsewhere) and experiments in the Adaptive Management Areas should provide critical information.

- Impacts on ROD species - There is very little information on the effects of density management thinnings on ROD species. Studies in the Salem and Eugene Districts of the BLM in conjunction with the National Biological Survey should add critical information. These studies are testing the working hypothesis that "regulation of stand density will produce, over time, a more diverse stand in terms of structure and species diversity." These studies are examining the effects of thinning on herbaceous species, aquatic vertebrates, mollusks, arthropods, bryophytes and lichens. Impacts on these species from thinning Riparian Reserves, though still largely unknown, are expected to be localized; this is anticipated because sites selected for thinning will be selected based on the need to improve late-successional forest characteristics.

**Monitoring Needs:**

- Establish a long-term, scientifically based monitoring system to determine the effects of forest harvesting on riparian ecosystems.

- Post-thinning treatments should be monitored for stand growth response through a series of plots on selected sites throughout the Resource Area.

# SOCIAL

## ISSUE: TIMBER

- ***Key Question: What is the potential for timber harvest within the GFMA lands of the S.F. Alsea watershed?***

**Background:**

The S.F. Alsea watershed contains approximately 40,400 acres of forest land; 57% federal land, and 43% privately owned. The 7% of the federal land which is managed by the Eugene District BLM has not been analyzed for timber projects. The Salem District manages the remaining 93% of the federal ownership. These lands fall under two land use designations as set forth in the Salem District Resource Management Plan (RMP); General Forest Management Areas (GFMA), also referred to as Matrix lands in the Northwest Forest Plan, and Late-Successional Reserves (LSR).

According to the RMP (Chapter 2 - 32), objectives for the GFMA lands include producing a sustainable supply of timber and other forest commodities, while also providing connectivity between LSRs, a variety of habitat and ecological functions, and early successional habitat. These objectives may be accomplished in the GFMA through timber management with certain restrictions. GFMA lands encompass 31% (7125 acres) of BLM-administered land in the S.F. Alsea watershed (see Map 2).

**Present Conditions:**

The overall age class distribution for the S.F. Alsea watershed closely follows the age class distribution for the Marys Peak Resource Area in general. As seen in Figure 14, LSR lands make up the majority of the acres in the S.F. Alsea watershed. Two major peaks occur in the 20-39 year and the 80-199 year age classes. Land in the 20-39 year age class was harvest regenerated during the 1950's through the 1970's. These acres present opportunities to perform precommercial thinning in the GFMA, and density management in the LSR. Acres in the 80-199 year age class were probably regenerated following fires that occurred around 1800 and the 1850's. They are old enough to be harvested, but timber harvest can only occur on the GFMA portion of these acres.

The age class distribution of GFMA lands is also shown in Figure 14. Most of the GFMA acres are in the 20-39 and 40-59 year age classes, resulting from harvest in the 1930's through the 1970's. Precommercial and commercial thinning respectively would typically take place in these age classes.

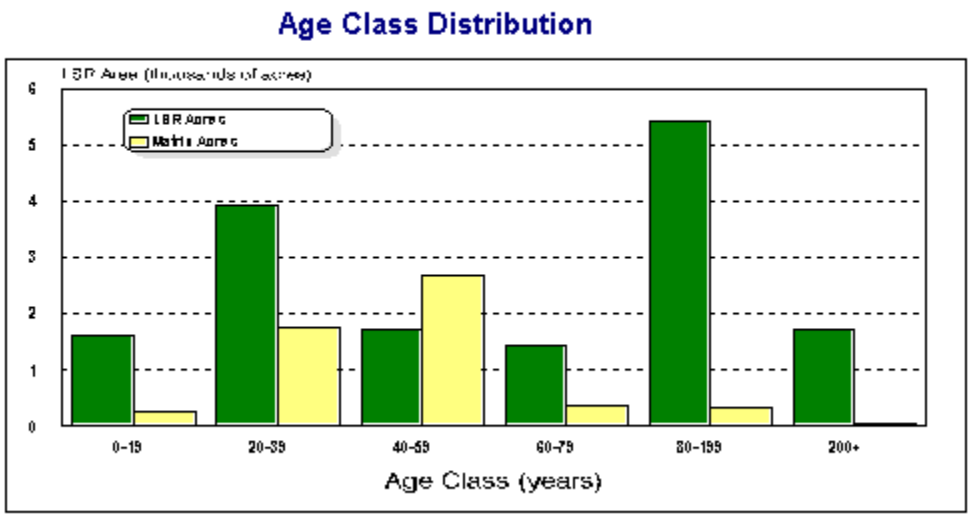


**Figure 14** Age class distribution of forested land managed by the BLM broken out by land use allocation.

**Desired Future Conditions:**

- According to the RMP (Chapter 2 - 32), objectives for the GFMA lands include producing a sustainable supply of timber and other forest commodities, while also providing connectivity between LSR's, a variety of habitat and ecological functions, and early seral habitat.

  GFMA lands will be responsible for providing the main timber flow from the watershed, and will be managed for a sustainable flow of timber by creating a more even age class distribution. Fertilization, precommercial and commercial thinning should be employed on as many stands as possible, so that in 50 years, the S.F. Alsea watershed has a good distribution of age classes, with healthy, diverse stands. The watershed was analyzed to determine where harvest and thinning within GFMA lands would help reach these objectives.

  GFMA land objectives and desired future condition will be accomplished through the use of the following stand treatments:

- **Regeneration Harvest** - Regeneration harvest is a tool which may be used to accomplish not only timber outputs, but also the regulation of the forest to supply an even flow of timber in the future. One way to obtain a sustainable flow of timber is to plan harvest units in such a way that the age class distribution of the timber is evened out. If there is a peak of acres in a certain age class, focused harvest in that area can bring these acres even with the other age classes. Once there is an even age class distribution, a set number of acres can be harvested each year to maintain that distribution and supply an even flow of timber. Potential regeneration harvest projects were identified in the GFMA through an analysis of stand age and composition.

Stands were identified which were 60+ years old and contained conifers.

- **Precommercial Thinning** - Precommercial thinnings (PCT) are another way to manage stands to achieve desired stand characteristics. Forest plantations are initially stocked with more trees than will be needed to stock a full grown stand. This is done purposefully, to ensure full stocking even after seedling mortality and to take advantage of as many good growing sites as possible. Once the trees have grown together a PCT is performed, which leaves the healthiest trees on the best growing sites, while still selecting to maintain diverse tree species. The age at which PCT takes place varies within the range of 10 - 30 years old and results in residual material being left on site to decompose.

- **Commercial Thinning** - Later in the life of a stand, usually between 30-60 years of age, commercial thinnings may be planned. Commercial thinnings involve further spacing of the trees, and selection to maintain or improve diversity of tree species on the site. Thinning results in stands of larger, healthier trees with additional light and room to grow and maximizes harvestable timber volume and quality over the life of the stand. Timber volume from the trees that were removed is normally marketable and sold to the highest bidder.

Potential commercially thinnable stands were identified using the following questions:

- *Is the stand ready to be thinned?*

  Current stand density and crown condition helps determine whether it is ready to be thinned. If the stand is heavily stocked, it is more likely to benefit from a thinning than a sparsely stocked stand, provided there is sufficient crown (leaf area) on the remaining trees to capture and utilize the increased light. This analysis identified any stands that had stocking levels greater than 40% as ready to be thinned. Percent stocking has to do with the number of trees on the site, and is not directly correlated with crown closure. Therefore, many stands with greater than 40% stocking have already reached crown closure, limiting the amount of light available to understory trees, and would benefit from a thinning to varying degrees.

- *Is the stand commercially thinnable?*

  Whether a stand is commercially thinnable or not has to do with several factors involving its current volume, the value of the timber in the stand and the cost of harvesting the trees. Two things must be determined: the volume to be removed in the thinning; and the value of the timber volume after deducting logging and transportation costs. By using stand exam data, stand type descriptions and aerial photos, the amount of volume to be removed by species can be determined. The value of the timber is estimated using log price tables. Then by creating an initial logging plan based on topography, availability of access and other factors, the logging difficulty and thus relative logging cost may be estimated. If the value of the timber to be removed in the thinning is greater than the cost to remove the timber, then that stand is commercially thinnable.

**Management Opportunities:**

- **Regeneration Harvest** - The harvest analysis identified 633 acres of GFMA land as suitable for harvest. In order to comply with the current Riparian Reserve standards, 72% of the suitable acres in Riparian Reserves would not be available for harvest. This leaves 178 acres currently available to be harvested in the GFMA (Map 14). Many of these acres would be difficult to harvest efficiently due to the small size, lack of road access or difficult logging setups due to riparian reserve boundaries. A substantial amount of acres in the GFMA (49%) is currently in the 40-60 year age range, which is too young to be harvested now (below minimum harvest age of 60 yrs old). However as these acres grow to a harvestable age, focused amounts of harvesting should be performed to redistribute the age classes more evenly, and promote a sustainable, even flow of timber. Refer to p. 48 of the Salem District RMP for a more detailed discussion of regeneration harvest in GFMAs.

- **Precommercial Thinning** - Precommercial thinning is usually performed 10-15 years after planting, and can provide limited wood outputs, in the form of small timber, posts, chips and/or firewood. Analysis for precommercial thinning opportunities is currently ongoing.

- **Commercial Thinning** - There were 2,592 acres identified for commercial thinning. Of these acres, 72% is within interim Riparian Reserve areas and may only be harvested to enhance Riparian Reserve habitat in compliance with the Aquatic Conservation Strategy standards. This leaves 714 acres in the GFMA available to be commercially thinned (Map 14) *and which the volume will count toward our allowable sale quantity.* It should be noted that if thinning is not allowed in Riparian Reserves, 72% of the potentially thinnable acres will go untreated, resulting in smaller, less vigorous trees within the riparian reserves.

- **Potential Harvesting Plan** - According to the RMP harvest estimates, the probable sale quantity for the GFMA lands within the Marys Peak RA will be 339 acres of regeneration harvest and 775 acres of thinning per decade. There are currently 715 acres of non-reserved GFMA land ready for commercial thinning in the watershed. This is sufficient acreage to focus initial thinning efforts in the watershed. During the first several years of the ROD implementation, thinnings will likely provide the bulk of the volume cut from this watershed. Regeneration harvest units located adjacent to or within commercial thinning areas should be planned in conjunction with the thinning sales. The bulk of regeneration harvests (178 acres) could then be performed later in the 1990's, when more watersheds have been analyzed and become available for treatment.

**Data Gaps:**

There is a sufficient amount of data available to analyze various harvest opportunities at the watershed level. However, there is a lack of site specific growth data at the stand level to enable optimum prioritization of treatments. This data is only collected currently after an area has been identified for potential treatment in order to develop the appropriate silvicultural prescription. If we could acquire stand level data across the watershed we would be able to prioritize treatments and optimize timing for the best overall accomplishment of stand development goals.

**Monitoring Needs:**

- Collection of stand level growth data especially on stands in the 20 - 50 year age classes to monitor stand growth and to better enable appropriate timing of treatments.

- We should monitor post treatment response to better understand the forest response to harvest and thinnings and to tailor our prescriptions to site specific conditions.

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- ***Key Question: Where do density management opportunities exist in the LSR lands of the S.F. Alsea watershed?***

**Background:**

According to the RMP, (Chapter 2 - 27), Late Successional Reserves (LSR) should be managed to protect and enhance conditions of late-successional and old-growth forest ecosystems as potential habitat for species dependent on these types of ecosystems. Commercial thinning, timber salvage and timber harvest are restricted on LSR land. LSR lands encompass about 74% of BLM-administered land in the S.F. Alsea watershed. Density management treatments can be used in LSRs to enhance old-growth characteristics in younger, homogenous stands. (Density management treatments refer to silvicultural treatments which manipulate stand stocking levels to promote desired habitat features commonly associated with old-growth or late-seral stands.) Given this potential, the S.F. Alsea watershed was analyzed to determine which stands might benefit from density management treatments.

According to the RMP (Chapter 2 - 114), a management assessment will be prepared for each LSR or group before habitat manipulation activities are designed and implemented. Among other things, this management plan will develop criteria for developing appropriate habitat manipulation treatments, and identify specific areas that could be treated. Therefore, this analysis was limited to identifying only an initial list of potential areas where density management treatments might be used to promote the future creation of old-growth or late seral habitat characteristics.

**Present Conditions:**

**Figure 14** indicates that LSR lands encompass a large majority of the acres 80-200+ years old in the watershed, which were regenerated by fire and harvest from the 1790's to the 1910's. There is also a smaller peak in the 20-39 year class due to regeneration harvest from the 1950's to the 1970's. Density management could be performed in these younger stands to promote future old growth forest characteristics.

The analysis to identify potential density management areas focused on stand stocking and

structural uniformity. The stands identified were those that were dominant Douglas-fir stands, 30 - 70 years old, with over 40% stocking and with a single story. One desirable habitat feature of late seral and old-growth stands is the existence of large trees. The mechanism for growing large trees faster is to remove certain trees from the stand, giving the remaining trees more light and room to grow. Therefore, stands with a high level of stocking would grow much larger trees if density management is performed. Another old-growth feature is it's lack of uniformity, both in stocking levels and in structural levels. Again, areas with uniformly high stocking levels could be silviculturally manipulated to produce more diverse patterns of stocking levels. Also, single story stands lack structural diversity, and could benefit from density management which reduces overstory stocking, so that a planted understory could grow.

The RMP (see Timber Resources, Chapter 2 - 60) requires retention of additional late-successional forest patches in landscapes where there is *less than 15%* of the federal ownership in timber age classes greater than 80 years old. The S.F. Alsea watershed currently has 32% of the federal ownership in timber that is 80 years or older, including LSR lands and reserved areas in the GFMA lands. Therefore, the watershed is currently in compliance with this requirement, and no additional LSRs need to be established in this watershed.

**Desired Future Conditions:**

- Meet requirements of the RMP and ROD to protect and enhance conditions of late-successional and old-growth forest ecosystems as potential habitat for species dependent on these ecosystems.

**Management Opportunities:**

- The analysis identified 3,672 acres of potential density management projects. Of this amount 2658 acres were identified within Riparian Reserves and 1,014 acres were outside of the Riparian Reserve areas. This is not a complete list of density management projects, but simply represents areas with potential for treatment. Further site specific analysis will be needed to determine the appropriateness of a particular area for treatment. Map 16 displays potential areas.

**Data Gaps:**

There is a sufficient amount of data available from our timber typing and forest inventory to analyze density management opportunities at the watershed level. However, there is a lack of site specific growth data at the stand level to enable optimum prioritization of treatments. This data is only collected currently after an area has been identified for potential treatment in order to develop the appropriate silvicultural prescription. If we could acquire stand level data across the watershed we would be able to prioritize treatments and optimize timing for the best overall accomplishment of stand development goals.

**Monitoring Needs:**

- Collection of stand level growth data especially on stands in the 20 - 50 year age classes to monitor stand growth and to better enable appropriate timing of treatments and stand prescriptions.

- We should monitor post treatment response to better understand the forest response to density management thinnings and to tailor our prescriptions to site specific conditions.

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# ISSUE: SPECIAL FOREST PRODUCTS

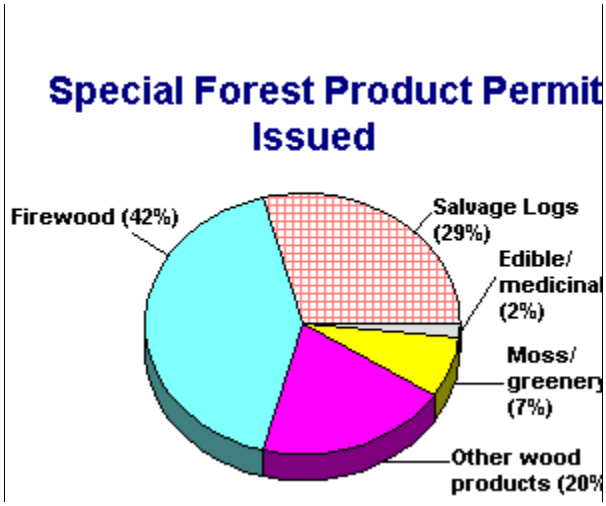


**Figure 15** The amount of permits issued for each type of special forest product by the BLM between 1986 - 1994.

- ***Key Question: How should the Special Forest Products program be managed in light of the new land use allocations and management direction of the RMP and ROD?***

**Present Conditions:**

There are many types of special forest products (SFP) which are gathered in the S. F. Alsea watershed. Special forest products include any wood product or other forest product gathered in the forest, excluding live standing timber. SPF collection permits in the Marys Peak Resource Area are sold for firewood and salvage or "blow down" trees as well as moss, tree boughs, floral greenery, mushrooms, medicinal herbs and bark. Little is known of the current condition of many of the non-wood products in the resource area.

In the S. F. Alsea watershed, permits for all types of special forest products are sold throughout the year. From 1986 to 1994, nearly seven hundred permits were sold in the S. F. Alsea watershed alone, creating over two hundred and sixty five thousand dollars in government revenues. Figure 15 shows the breakdown of permits by category for the watershed and Figure 16 shows the revenue breakdown for the same permits and time period. The majority of SFP permits and revenues are due to the sale of salvaged blowdown trees. Salvage logs account for 94% of the total receipts, and over 99% of the total permit revenues are received through the sale of wood products in general (salvage logs, firewood and other wood products). The percentage of SFP revenues that can be attributed to non-wood products (moss, greenery, edibles such as mushrooms, and medicinals) is less than 1% . This percentage is likely to increase in the near future as demand for these products increases and less timber is available salvage due to RMP guidelines.

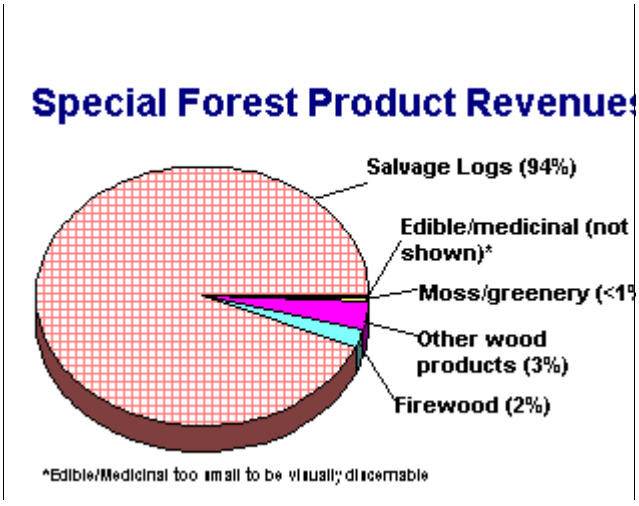


**Figure 16** The amount of revenue collected for each type of special forest product shows that salvage logs are the largest revenue producers.

**RMP Standards and Guidelines:** The RMP outlines new standards and guidelines with respect to the harvest of special forest products, which have a direct bearing on the Desired Future Condition of the SFP program. These guidelines apply mostly to the harvest of wood products, and are specific to each land use allocation (see Salem RMP 2-61,62). The S. F. Alsea watershed contains two main land use allocations, LSR and GFMA as well as Riparian Reserves. Below is a summary of guidelines specific to the more restrictive areas of LSRs and Riparian Reserves.

**Late-Successional Reserves:** Standards and guidelines for LSRs limit the harvest of special forest products to a greater extent than on GFMA lands. LSR lands are set aside to protect and promote older forest ecosystem types. Some of the guidelines affecting harvest of special forest products include:

1) Harvest of salvage logs is limited to areas of "catastrophic" blowdown or disease, which is defined as greater than 10 acres and having less than 40% crown closure remaining at

the site. All planned salvage operations are also subject to review by the Regional Ecosystem Office.

2) Firewood gathering is limited to existing cull decks, thinning areas, and timber sale areas where excess down wood impedes future activities or creates a large scale disturbance hazard, and where blowdown trees block roads.

3) Harvest of any special forest product in LSRs must be evaluated for possible adverse effects on LSR objectives, resource sustainability or other resource values.

In addition to these restrictions, (see RMP Chapter 2-61), the RMP calls for additional analysis to determine whether existing levels of SFP harvest constitute a significant effect on late successional habitat in the LSR. This analysis should be addressed in the management assessment which will be completed for each LSR (see RMP Chapter 2-114).

**Riparian Reserves and Protection Buffers:** Riparian Reserves are located in all of the RMP allocations including LSRs and Protection Buffers. Riparian Reserves range from 210 feet on each side of intermittent or seasonally flowing streams to 420 feet on each side of fish-bearing perennial streams. Harvest of wood products is limited in Riparian Reserves (see RMP, Chapter 2-61). Where catastrophic events result in degraded riparian conditions, fuelwood cutting is allowable if required to attain Aquatic Conservation Strategy objectives. Harvest of other special forest products is permissible in Riparian Reserves.

Under the RMP, Protection Buffers will be established to protect rare and locally endemic species. No special forest products of any kind may be harvested within Protection Buffers. These areas have not yet been identified, and so the extent of the impacts from these buffers is unknown. However, the areas protected are expected to be small.

**Desired Future Conditions:**

- Any future SFP program will need to be sensitive to the requirements of the different land use allocations. According to the RMP guidelines (Chapter 2-62), specific guidelines should be established for the management of individual SFP species, and all species which are gathered by permit will be monitored to prevent over harvesting. In the interim, SFP harvest should be allowed to continue in the various land use allocations, as subject to the aforementioned restrictions.

  As discussed above, the majority of the value of SFP permit revenues has come from the sale of wood products. Under current standards and guidelines, the sale of wood product permits is likely to decrease. This will result in the average value of permit revenues to decrease. Permit revenues will no longer cover the costs of running the program, and money would be saved by re-instating the free use permit, which could reduce administrative costs.

**Management Opportunities:**

- The SFP program in the Marys Peak Resource Area will continue to provide the opportunity for the public to harvest special forest products, while establishing clear policy and direction for these resources, enabling the BLM to more effectively manage and regulate the harvest of special forest products, thus protecting the resources and reducing possible hazards and environmental impacts.

**Data Gaps:**

- Lack of data on the current condition of many special forest products (e.g., mosses, mushrooms, floral greenery).

- Lack of long-term, detailed data on the ecological responses of special forest products to harvesting.

**Monitoring Needs:**

- Establish a long-term, scientifically based monitoring system to determine the effects of harvesting on special forest products.

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# ISSUE: ROADS

- ***Key Question: What is the current and projected use of roads in the watershed?***

**Background:**

A Transportation Management Plan to establish objectives for the transportation system in the S. F. Alsea watershed is currently being developed. The future management status of roads in the watershed will be determined in this plan (see Appendix 16 for the process). This plan will be based on data collected from a 1994 field inventory of roads and drainage structures in the watershed. The Transportation Management Plan will provide data and resource information necessary to make decisions in an interdisciplinary resource process. These decisions may include improving existing roads and drainage structures, limiting access, road obliteration, or no action. The interdisciplinary approach evaluates resource constraints and primary uses of roads to determine the preferred road management action.

**Present Conditions:**

Roads within the S. F. Alsea watershed are primarily gravel roads of which 21 miles are controlled by private landholders, 112 miles by the Bureau of Land Management (BLM), and 9 miles by Benton County (Table 7). Paved access roads are controlled by BLM (22 miles), Benton County (5 miles), and the State of Oregon (6 miles). Unsurfaced roads account for only

10% (18 miles) of the total transportation system in the watershed. The South Fork Alsea Back Country Byway is the major access route through this watershed and is controlled by BLM to the east and Benton County to the west. State Highway 201 from Alsea provides 6 miles of paved access south through private and federal lands.

The transportation system in this watershed has been used primarily for managing timber and transporting logs to the mill. Other common activities that use the road system involve recreation such as: hunting, fishing, camping, hiking, sightseeing, and minor forest product uses. Although logging has decreased on federal lands, private landholders continue to manage their land primarily for timber production and therefore, access to and through those federal lands should be preserved. There are a few small woodlot/homeowners in the westerly portion of the watershed that use Highway 201 and the South Fork Alsea Back Country Byway for daily commutes and other transportation needs.

***Road Types:*** There are three main road designations used by the BLM in discussing roads: **primary, secondary** and **local. Primary** roads are major through access routes designed and maintained for high use by all types of vehicles (logging, hauling, personal commuter, recreational). These roads have paved or crushed rock surfaces and are maintained continuously as needed. **Secondary** roads are routes frequently used for transportation of forest products or dispersed recreation (hunting, fishing, sightseeing, etc.) that have a definite terminus. These roads are generally surfaced with crushed rock and are maintained annually or during sustained use for timber haul. **Local** roads are usually short (1 mile or less) roads that access specific resource management units where use is limited to short term transportation of forest resources and some dispersed recreation. Surfacing may consist of some form of rock or just natural soil and typically are maintained only when used for transporting forest products.

***Road Closures:*** Historically roads controlled by BLM, State of Oregon, and counties have remained open at all times for public use. State and county controlled roads in the watershed are required by laws and regulations to provide public access. There are approximately 54.72 miles of BLM controlled roads that are encumbered by access documents with private landholders. Closure status on these roads should be a joint decision and must be approved by all parties covered by the document. Primary and secondary BLM controlled roads are maintained to provide access for management of federal lands. Many "local" BLM controlled roads have closed themselves with vegetation through lack of use. Private roads account for approximately 168 miles (50%) of the roads in the watershed and most are open at all times. There are a limited number of private roads that are closed by gates, earth berms, or vegetation. Several roads in the watershed are utilized as travel corridors for wildlife, mainly deer and elk.

Each BLM controlled road in the watershed was evaluated for its need for management activities as well its resource impact and whether or not it should be considered for closure. Each team member evaluated each road using a criteria specific to their resource or area of concern (wildlife, fish, hydrology, soil, recreation, timber, road engineer). Impacts were ranked as high, medium or low. Then the same process was then used to evaluate the future need or beneficial use of each road. See *Appendix 16* for sample form and process outline. Overall ratings for each road were then calculated weighing access needs for BLM and private uses with overall resource

impacts. As a starting point we considered that roads within LSR or key watersheds should be closed unless the beneficial uses and lack of resource impacts justified keeping the road open. If the BLM needs didn't justify keeping the road open but there was an existing right-of-way agreement for private landowner use, the recommendation was not for complete closure but for temporary closure with gates. Roads in the GFMA, where the majority of future management actions would take place on BLM lands, were initially considered to remain open and we looked for high resource impacts and few beneficial uses to justify closing those roads.

**Desired Future Conditions:**

The desired future condition for roads are contained in the objectives and management direction which has been outlined for each land use allocation described in the ROD and RMP. The overall goal for roads is to develop and maintain a transportation system that serves the need of users in an environmentally sound manner. The desired future conditions that are most pertinent to roads in the SF Alsea watershed include (p. 62, Salem District ROD for complete list):

- reduce the overall road density within the watershed by closing or removing minor collector roads or unused roads that are no longer needed.

- minimize impacts on the Riparian Reserves and follow Aquatic Conservation Strategy guidelines.

- reduce roads in key watersheds.

- develop a transportation management plan for all roads in this watershed

**Management Opportunities:**

- Potential methods that could be used to reduce road densities are: 1) gate secondary roads to allow "local" spur roads to overgrow with vegetation, 2) obliterate roads where future entry for management is not needed, 3) close "local" roads with earth berms and remove major drainage structures, and 4) when constructing new roads, eliminate similar miles of existing roads in the area.

- Completion of the Transportation Management Plan will identify roads controlled by BLM that may be closed or gated to enhance wildlife populations or reduce resource impacts in the watershed. Conversely, BLM roads will be identified to be kept open for access to BLM or private timber management and recreational activities. Needs for upgrading those roads will also be prioritized. A list of road segments identified for potential closure is displayed in Appendix 17. A total of 30 miles of road could potentially be obliterated or closed with earthberms and 50 miles of road were identified for closure with gates.

- Reduce roads in the Tobe Ck. Key Watershed.

**Data Gaps:**

- Lack of data on private controlled roads with respect to closure status, gates, and abandoned roads.

- Lack of information on drainage structure condition on the S.F. Alsea Back Country Byway.

**Monitoring Needs:**

- A monitoring plan will be developed for annual review of the transportation system. Management opportunities that are performed will be evaluated for their effectiveness in accomplishing the road management objectives identified in the Transportation Management Plan.

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- ***Key Question: Does the condition of roads in the watershed meet the current and projected uses of the transportation system?***

**Background:**

The Transportation Management Plan classifies roads into high, medium, or low risk categories, to indicate their potential for adversely affecting water quality. "High-risk" roads could have some of the following characteristics:

1) no surfacing;
2) inadequately maintained;
3) occur in highly erosive soils or unstable areas;
4) improper drainage or undersized culverts;
5) inadequate stream crossings;
6) high traffic flow.

**Present Conditions:**

Roads constructed from 1950 to 1975, most of which were primary or secondary roads, used construction practices ranging from poor construction (e.g., poorly compacted) and over construction to excellent construction using good, high quality techniques. Road locations and designs were often planned for logging a particular setting while attempting to avoid other land owners. In some cases, this caused additional roads to be constructed, sometimes on marginal terrain, where they could have been avoided. Transportation planning for location and design of new road construction has considered the entire watershed for the most part since 1975. Most differences in quality of road construction can be attributed to either the road builder or the inspector responsible for monitoring and approving the construction.

A field inventory of current road conditions including drainage structures was completed in 1994. The majority of roads in this watershed are in very good condition. Most roads are rock surfaced, have vegetated slopes, and have properly functioning drainage structures. Approximately 18 miles of unsurfaced roads were identified that either need surfacing or permanent closure. The South Mountain county controlled road 47160 (3.3 miles) is the major sediment source contributing to poor water quality in the watershed. This steep unsurfaced road traverses both private and BLM-administered land and is only maintained during periods of use. Some of the remaining unsurfaced roads are slightly rutted and either need some rock or need to be obliterated. Decisions to rock or obliterate roads will be based on the Transportation Management Plan recommendations. Most of the unsurfaced roads in the watershed are located on flat, stable ground and are not contributing to any noticeable problems. Drainage structures installed during the 50's and 60's are beginning to fail due mainly to deterioration. Others have problems because standards have changed and structures may have been undersized by today's standards.

**Desired Future Conditions:**

- The desired future condition of the transportation system in the S. F. Alsea watershed is to apply mitigating measures that reduce the potential for existing roads to adversely affect streams, and design new roads to minimize risks affecting water quality.

**Management Opportunities:**

- The emphasis for restoration projects to mitigate resource damage will begin with "high-risk" roads.

  Corrective measures could include: 1) upgrade existing drainage structures not adequate to accommodate a 100 year flood event, 2) install outlet structures on existing culverts to reduce erosion of fillslopes and dissipate energy, and 3) vegetate bare slopes along road prisms. Some "local" roads that have potential to contribute sediment into streams and management determines future access is not needed, may be obliterated. New road construction techniques will utilize the Best Management Practices (BMP's) as stated in the RMP. See Appendix 17 for a list of corrective measures already identified for BLM roads.

**Data Gaps:**

- A major information gap is lack of road/culvert data and condition on approximately 142 miles of private controlled roads.

**Monitoring Needs:**

- The monitoring plan will include examination of roads during and following major storm events to identify erosion problems associated with drainage structures, surface condition, and roadside slopes.

# ISSUE: RECREATION

**Background:**

The Recreational Opportunity Spectrum (ROS) provides a framework for stratifying and defining classes of outdoor recreation opportunity (experience). While the goal of the recreationist is to obtain satisfying experiences, the goal of the recreation planner becomes one of providing the opportunities for obtaining these experiences. By managing the natural resource setting and the activities which occur within them, management is providing opportunities for recreation experiences to take place. Therefore the planner, recreationist, and recreation opportunity can be expressed in terms of three principal components:

| | |
|---|---|
| *Setting Opportunity:* | What are the areas characteristics in terms of physical, social, and managerial? |
| *Activity Opportunity:* | What do folks do in the watershed? |
| *Experience Opportunity:* | What do folks feel about their experience? |

For management and conceptual convenience, possible mixes of activities, settings, and probable experience opportunities have been arranged along a spectrum, or continuum known as ROS. This spectrum is divided into seven classes as described in the RMP.

The Oregon State Parks and Recreation Division, in their 1988 publication entitled, the Statewide Comprehensive Outdoor Recreation Plan or SCORP, discusses a shortage of: non-motorized ROS categories and recreational areas accessible to the disabled. The S. F. Alsea watershed is within SCORP Region 8, which has a non-motorized shortage of: camping; camping (dispersed); hiking/mountain biking/equestrian trails; nature activities; and designated off-highway vehicle areas.

- ***Key Question: What are the disabled access needs and opportunities?***

**Present Conditions:**

Section 504 of the Rehabilitation Act of 1973, and the Americans with Disabilities Act (ADA) of 1990, requires that all BLM developed facilities provide for the disabled. BLM has recently paved the S. Fork Alsea River Campground (wheel chair accessible) which provides access to barrier free comfort stations. The Alsea Falls Recreation Site picnic area needs to be improved to provide barrier free accessibility.

**Desired Future Conditions:**

Meet requirements of section 504 of the Rehabilitation Act of 1973.

**Management Opportunities:**

Fund additional projects in the S.F. Alsea River Campground and Picnic Area that will provide recreational opportunities for the physically disadvantaged community with diverse physical, visual, and auditory needs. For example, wheelchair visitors of all abilities should be able to use restroom, parking, and interpretive facilities with comfort and enjoyment. Improvements for accessing the Alsea Falls picnic area are the highest priority.

**Data Gaps:**

Need additional information on needs of the physically disadvantaged community.

**Monitoring Needs:**

Monitoring standards will be developed to ensure the suitability of recreational projects to meet the needs of the physically disadvantaged community.

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- ***Key Question: Where are potential facility locations and what factors (e.g., road conditions, demand, use levels, capital investment, size, capacity, accessibility and type) affect the suitability of these sites?***

**Background:**

With a growing population base and two major metropolitan areas (Corvallis and Eugene) within an hours drive of this watershed, the S.F. Alsea watershed is uniquely situated to provide both day use and destination recreation activities. Specific demand for more hiking, biking and horse trails has been growing annually and the developed recreation sites are not adequate to meet peak demand. This analysis looked at what were the potential areas for new recreational development and how that use would fit in with potential road closures and other management actions in this watershed.

Management actions of all types, but especially road access, impact recreational opportunities. Roads provide access for all types of recreation and the closure or gating of roads can limit access but at the same time provide for new types of recreational opportunities. If a forest road is not cleared of brush every three years, it can become impassible. The decrease in road maintenance funding will lead to road closures either through lack of use or by design. This will decrease roads available for driving, sightseeing, road hunting, etc. Closed roads can also become trails and provide new opportunities for horse, mountain bike and hiking trail

development.

**Present Conditions:**

*Roads:* See Roads section for a more extensive discussion of present road conditions. To summarize briefly here, the road network in the watershed is extensive. One road is paved (the South Fork Alsea River National Backcountry Byway), and the majority of the roads are rocked or unsurfaced timber haul roads. Some roads in the area are reverting back to their natural state due to the lack of maintenance and vehicular use. There is a potential to restrict motorized vehicle access on up to 85 miles of BLM controlled roads out of 112 total miles. Vehicle access for all types of closures would limit such activities as sightseeing and four- wheel driving. However, lands accessed by these roads would remain open to the public by non-motorized vehicles only or by access on foot. Even with the closure of some roads there will remain an extensive network of roads to allow for driving access and motorized recreation.

There is a large amount of privately controlled roads in the watershed and most of these are open to the public with some exceptions for periods of high fire danger and other private land activities. Given a checkerboard ownership pattern, any proposed closures and new trail development will need to be discussed thoroughly with other landowners.

*Dispersed Recreation:* The dispersed recreation activities that presently occur within the watershed include: road hunting, hunting using a gun or bow; camping (dispersed); picnicking (dispersed); fishing; collection of trees/plants (wood permits, mushrooms and bear grass for profit or fun); target shooting; Off-Highway Vehicles (motorcycles, mountain biking, and 4 x 4 use); driving for pleasure; and sightseeing (i.e. Alsea Falls, Green Peak Falls, and wildlife).

*Developed Recreation* The S. F. Alsea watershed is a destination area for recreational use. There are three developed recreation facilities in the watershed: BLM's Alsea Falls Picnic Area ( 21 family picnicking units), BLM's Alsea Falls Campground (7,500 visits per year; 16 family camping units), and the privately owned McBee Park (two large covered picnic facilities with dispersed camping). Each of these facilities is located adjacent to the S. F. Alsea River. During summer weekends, the overnight accommodations are at capacity. Dispersed camping is concentrated near McBee Park most of the summer. During the fall, dispersed camping occurs throughout the watershed. The most popular activities are: camping, picnicking, viewing Alsea and Green Peak Falls, hiking a short designated trail system, hunting, and OHV use.

*Off-Highway Vehicles (OHV)* Pursuant to the RMP, the majority of BLM-administered lands will be available to off-highway vehicle use. Off-Highway Vehicle (OHV) use on BLM-administered lands is regulated to minimize adverse impacts: to resource values; conflicts between visitors; and to promote public safety (Executive Orders 11644 and 11989, and 43 CFR 8340).

In the extreme northern part of the watershed, motorcycle racing is extensive, and recognized as the Greasy Creek/Gleason Creek OHV Area, a regional attraction. Approximately 6,000 visits

occur on an elaborate system of primitive forest roads and trails. The complete system overlaps onto three different watersheds (Benton Foothills, N. F. Alsea River, and S. F. Alsea River). Most of the use occurs within a four mile radius of Flat Mountain. Many of the road and trail segments are on private land. Starker Forest, Inc., regulates the motorcycle users by requiring them to obtain work-ride permits (no-work/no ride). Pursuant to the RMP, BLM will enhance OHV opportunities in the Greasy Creek/Gleason Creek OHV Area.

From McBee Park, a small series of motorcycle trails climb through the BLM land in 14-7-23.

*Recreational Driving* Driving for pleasure is a popular use of the area. BLM designated the South Fork Alsea River National Back Country Byway about five years ago (BLM Road 14-6-34.1). It is the most heavily used road within the watershed. The local community uses this road as a short cut to the Oregon Coast, Highway 99 W., and the Mid-Willamette Valley. BLM controls this paved road, which is approximately 11 miles in length.

The Tobe Creek Road (14-7-18) is a gravel road that BLM controls. The road receives moderate vehicular traffic and its standards are sufficient for a passenger vehicle. This road could be used to access the Upper Lake Creek Special Recreation Management Area, in Eugene District.

The highest vehicular use of forest roads occurs during the summer and autumn months (wood cutting; hunting: deer, elk, bear, grouse, quail, and rabbit, and motorcycle racing (autumn, winter, and spring months).

While visitors from the Valley can enjoy the short scenic drive along the Back Country byway, many of the secondary roads are more suitable for dispersed, non-motorized activities such as mountain biking and are being used for these activities more each year. However, there are currently no official equestrian or mountain bike trails within the South Fork Alsea watershed. Adjacent to Alsea Falls Recreation Site in Section 35 of T.14 S. R 7 W. are numerous roads and skid roads that would be ideal for mountain bike loop trails. Students at Oregon State University recently completed a proposed plan for designing a series of loop trails for mountain bikes in this area. The area has been proposed to be gated to reduce road maintenance costs and impacts to the wildlife. This will allow additional bike riding areas along with increased safety within the gated section. In addition, BLM already sponsors an annual 60 mile road bicycle race along the South Fork Access Road (Back Country Byway).

**Desired Future Conditions:**

Since much of the S.F. Alsea watershed will be managed as a LSR (see Map 2), we assume that wilderness-like conditions will develop over time. General objectives of the LSR will be to enhance and maintain biological diversity and ecosystem health to contribute to healthy wildlife populations. Since there will be minimal management activities in this area and there is a good blocked area of BLM managed land, it would be ideal for certain types of dispersed recreational development such as trails. The southeastern corner of the watershed is within the GFMA land use area. This area is dominated by young stands of Douglas-fir, is where most timber harvesting and other land management activities will be occurring and has recreational potential for road to

trail conversion. See pg. 41 - 45 of Salem District ROD for further discussion of recreation goals by land use allocation.

*Developed Recreation* The GFMA area provides the best ROS experience opportunity for potential road to trail conversion(s). The southern boundary of the S. F. Alsea watershed adjoins Eugene District's Upper Lake Creek Special Recreation Management Area (SRMA). The desired future condition for this area is to meet the increasing demand for recreational settings with little development and management activity, relatively low use, and little to no motorized access permitted. The desired future condition would be to link our existing developed recreation sites to Hult Reservoir in the Upper Lake Creek SRMA via the proposed S. F. Alsea River Trail (i.e. S. F. Alsea watershed proposed road to trail conversions: road 15-6-18; and Upper Lake Creek SRMA proposed road to trail conversions: roads 15-7-13.1, 15-7-14.3, and 15-7-23.1). There is also access from the South Fork Access Road to Hult Reservoir by way of road 14-6-34.

The Fall Creek Road (14-7-25) has the potential to be promoted for access as part of the mountain biking system; it is a paved loop system and it is accessible from the Byway Road 14-6-34.1. The road is steep, narrow and paved, and would not be suitable for mixing vehicular and non-vehicular recreational uses. A comfort station could be constructed adjacent to the parking area along road 14-7-25. This would relieve some of the increased needs for additional facilities within the campground.

The Alsea Falls Trail system linking Green Peak Falls, McBee Park and Alsea Falls, has the potential to be expanded to include a new interpretive trail into one of the few remaining natural wetland areas. This is adjacent to the Backcountry Byway and within the trail system connecting to the Upper Lake Creek Special Recreation Management Area (SRMA). Development would include low impact trails,(hiking) bridges, and interpretive signing.

*Recreational Driving*: We should continue to promote the Backcountry Byway (14-6-34.1)since it is the most traveled road within the watershed and it has many spur roads along the 11 miles which provide opportunities for sightseeing, picnicking, and dispersed camping. We could provide additional recreational driving opportunities from the Byway to Eugene District's Upper Lake Creek Special Recreation Management Area (10,515 acres) via both the graveled Tobe Creek road (14-7-18)and, from Glenbrook, via road 14-6-34. We would need to discuss these ideas with private landowners who control small portions of these routes.

*Scenic Quality*: The desired future condition of Visual Resource Management (VRM) Class 2 is to retain the existing character of the landscape along the South Fork National Back Country Byway. The level of change to the characteristic landscape should be low.

**Management Opportunities:**

- Improve recreational opportunities for the physically disadvantaged:

  a) Construct an over look by Alsea Falls that is wheel chair accessible.

b) Increase our ability to serve the physically disadvantaged community in providing an outdoor recreation experience at: Alsea Falls Picnic Area and Alsea Falls Camping Area. Prioritize physically disadvantaged projects at Alsea Falls Picnic Area (i.e. wheel chair access to Alsea Falls Viewing Area; comfort stations; and parking).

- Establish S. F. Alsea River (equestrian, mountain biking, hiking) Trail (pursuant to the RMP) and link the existing facilities (Alsea Falls Picnic Area, Alsea Falls Campground, and McBee Park) to Hult Reservoir in the Upper Lake Creek Special Recreation Management Area.

- Enhance and designate an off-highway vehicle area at Greasy Creek/Crooked Creek. Some possible enhancement measures include: better signing; construction of parking areas with off-loading ramps and restrooms; and placement of stream crossing structures; etc. Specific enhancement measures will be addressed in subsequent project plans.

- Convert Alsea Falls Picnic Area to expanded or dispersed camping or develop as overflow camping area.

- Plan and designate some mountain bike road to trail conversions in 14-7-35 as part of the overall watershed restoration efforts. Road decommissioning and or restricted access (gated, limited access) of roads will also be part of watershed restoration. These activities will compliment the demands for semi-primitive, non-motorized recreational opportunities.

- Develop and improve recreational opportunities for nature activities. (i.e., provide interpretive opportunities from the trail system(s) along the S. F. Alsea River).

- Promote Tobe Creek Road as an access road to link the S. F. Alsea River Recreation Area with the Upper Lake Creek Special Recreation Management Area.

- Develop Alsea Falls expansion campground (pursuant to the RMP).

- Develop additional hiking trails from the Alsea Falls campground and picnic area to view old-growth, wetlands, etc.

**Data Gaps:**

- Additional information is needed on potential recreational sites and their suitability for development.

- There is a lack of information from potential user groups as to there needs for expanded recreational facilities and the types of recreational opportunities that are most desired.

**Monitoring Needs:**

- Monitoring standards should be developed to assure the adequacy of recreational developments

to assure their suitability for public use.

- User groups and current recreationists at our facilities should be surveyed to determine adequacy of current facilities, need for more opportunities, quality of their experience, etc. on a regular basis.

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# ISSUE: LAND TENURE ADJUSTMENT

- ***Key Question: What are the opportunities for land tenure adjustments?***

**Background:**

Three land tenure zones are identified for BLM- administered lands in the Salem District:

1) Zone 1 includes lands and other areas identified as having high public resource values. These lands would generally be retained under BLM administration.

2) Zone 2 includes lands that meet criteria for exchange because they form discontinuous ownership patterns, are relatively inefficient to manage, and may not be accessible to the general public. These lands could be blocked up in exchange for other lands in zones 1 or 2, transferred to other public agencies, or given some form of cooperative management.

3) Zone 3 includes lands that are scattered and isolated with no known unique resource values. These lands would be available for use in exchanges for inholdings in zone 1 or zone 2. They are also potentially suitable for disposal but this would only occur if important recreation, wildlife, watershed, threatened or endangered species habitat and/or cultural values are not identified and no viable exchange proposals for them can be identified (Salem District RMP).

**Present Conditions:**

The SF Alsea watershed is comprised of both zone 1 and 2 lands. One hilltop communication site exists within the watershed. Right-of-ways have been granted for logging roads, domestic and irrigation water lines, and utility lines servicing residencies. The majority of these are within or adjacent to road corridors. There are no transmission line corridors as well as no active applications for major water storage or hydroelectric projects in the watershed.

Ecosystem management is most efficiently conducted in lands with contiguous ownership. BLM-administered lands in this watershed are fairly contiguous in areas south and west of the South Fork Alsea River, but are more scattered or checker-boarded in areas to the north and east of the South Fork. Ecosystem management would also be well served by the availability of control watersheds from which to gauge the effects of forest management in other watersheds. Ownership of the entire watershed or subwatershed would facilitate the establishment of these control areas. In the South Fork Alsea watershed, the BLM administers most of the Tobe Creek and Rock Creek subwatersheds making both of these subwatersheds potential areas for blocking up ownership.

**Desired Future Conditions:**

The objectives for land tenure adjustment are described in the Salem District ROD and RMP (pp. 53 - 55). In summary these include: 1) facilitate access to public lands and resources (as a matter of practice, O&C forest lands allocated to timber management will only be exchanged for lands to be managed for multiple-use purposes); 2) maintain or enhance important public values and uses; 3) maintain or enhance local social and economic values in public ownership; and 4) facilitate implementation of other aspects of the approved resource management plan.

**Management Opportunities:**

Adjust land tenure in this watershed to achieve the following results:

- Enhance development of interior older forest conditions with priority given to the Prairie Mountain area which already has some contiguous habitat;

- Provide dispersal corridors for older forest associated wildlife species with emphasis on linking the spotted owl habitat in this watershed to habitat areas further north in the Coast Range;

- Protect special habitats such as wetlands, grass balds, etc. (e.g., in the South Fork Alsea River corridor and on Prairie Mountain, respectively);

- Provide control subwatersheds (i.e., the Rock Creek and/or Tobe Creek subwatersheds) to evaluate future management actions in other watersheds;

- Provide linkage of Salem District recreational sites (i.e., Alsea Falls area) with Eugene District sites;

- Enhance Salem District management within the watershed by acquiring Eugene District BLM lands in the South Fork Alsea watershed.

**Data Gaps:**

Need additional information on land resource values for specific parcels of private and public lands to permit logical and reasoned decisions on land tenure adjustments.

**Monitoring Needs:**

Assess desirability of land tenure adjustments and efficiency of the adjustment process at periodic intervals.

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# Map Packet - S.F. Alsea Watershed

| Map # | Title |
|---|---|
| 1 | Subwatersheds and Major Streams |
| 2 | Ownership and Land Use |
| 3 | Landslide Potential and High Risk Roads |
| 4 | Seral Stage Distribution On BLM Lands |
| 5 | Vegetation Classes From Landsat Imagery |
| 6 | Special Habitats Based on Soil Types and Plant Communities |
| 7 | Late Seral and Old-Growth Habitat Conditions |
| 8 | Suitable Habitat Conditions Within Provincial Home Range Circles of Spotted Owl Sites |
| 9 | Stream Temperature Risk Classification |
| 10 | Large Woody Debris Potential For Fish-Bearing Streams |
| 11 | Large Woody Debris Potential in Headwater Streams |
| 12 | Chinook and Coho Salmon Distribution |
| 13 | Steelhead and Cutthroat Trout distribution |
| 14 | Riparian Reserves On BLM Managed Lands |
| 15 | Harvest Opportunities Within General Forest Management Area |
| 16 | Density Management Opportunities Within Late Successional Reserves |

# APPENDICES