SOUTH FORK McKENZIE

WATERSHED ANALYSIS

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Blue River Ranger District
Willamette National Forest

For further information contact:

Administrative Contact:

Lynn Burditt, District Ranger

Blue River Ranger District
Blue River, OR 97413

Technical Contact

Karen Geary, Team Leader
Watershed Analysis
Blue River Ranger District
Blue River, OR 97413

Team Members:

Karen Geary	**Team Leader**
Michelle McSwain	**Hydrologist**
Doug Shank	**Soils/Geology**
Rick Breckel	**Wildlife Biologist**
Gary Marsh	**Silviculturist**
Amy Unthank	**Fisheries Biologist**
Cindy McCain	**Ecologist**
Allison Reger	**Analyst/Information Management**
Suzanne Schindler	**Writer/Editor**
Dave Sprio	**GIS**
Tere DeSilva	**GIS**
Pat Ford	**Botonist**
Bob Longcore	**Landscape Architect**
Palmer Utterback	**Engineer**

Acknowledgements

The South Fork McKenzie Pilot Team began a journey to understand one watershed in the Oregon Cascades. Those team members who came from other units of the Willamette National Forest were welcomed to the District by all of the Blue River personnel. The entire Team was especially supported by District Ranger Lynn Burditt, her staff, and the District personnel who keep the day to day operations going. Diane Williams and the entire Administration section pitched in and made our temporary space "home". The journey would not have been nearly as successful without the support and dedication of Tere DeSilva and Dave Spiro in GIS at Blue River. Various additional people provided key support and a truly inter-agency product. These include: Rosana Costello and Ken Adee of the Supervisor's Office GIS shop; Dan Howells Bureau of Land Management, Sue Livingston U.S. Fish and Wildlife Service (USFWS), Ray Bosch USFWS, Ron Lee Environmental Protection Agency, Rowan Baker National Marine Fisheries Service, Wade Stampe U.S. Army Corps of Engineers (ACE), Bob Magne ACE, and the Lane Council of Government staff.

The ability to spend a full time effort beginning in March 1994 allowed us time to learn and share knowledge gained with team members and supporting individuals. The effort was a collaborative learning process where humor and patience were as important as sharing results. The team also had the research faculty at H.J. Andrews Experimental Forest to help guide us in asking valid questions about the processes in the watershed.

The team hopes that our efforts will help the Willamette and the Region to continue to implement successful watershed analysis. Integration of our results was a key process, often very exciting and at other times a significant challenge. It will be for others, both on and off the Forest, to take the best of our efforts and improve upon them. Many other people contributed, including several individuals who literally went the extra mile to gather riparian and stream survey information, and we acknowledge their efforts by listing them at the end of this document.

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CHAPTER I - INTRODUCTION

WATERSHED ANALYSIS

The purpose of watershed analysis is to develop and document a scientifically based understanding of the processes and interactions occurring within a watershed. The document you are about to read is the current understanding of the South Fork of the McKenzie River Watershed (Figure 1).

This document contains information on what processes are active within this watershed, how those processes are distributed in time and space, what the current upland condition and riparian conditions of the watershed are, and how all of these factors influence riparian habitat and other beneficial uses. The watershed analysis will then be used at the site level to set appropriate boundaries for Riparian Reserves, plan land use activities compatible with disturbance patterns, design road transportation networks that pose minimal risk, identify what and where restoration activities will be most effective, and establish specific parameters and activities to be monitored.

The South Fork Watershed Analysis is one of fifteen "Pilots" that were charged with using the January 1994 "Federal Agency Guide for Pilot Watershed Analysis" and providing feedback for future updates to the Guide.

No decisions are made with this document. The findings represent a foundation on which to develop site specific project proposals and base specific decisions. This document will continue to be updated and revised as land management and natural events change the conditions of the watershed.

SOUTH FORK MCKENZIE WATERSHED
VICINITY MAP

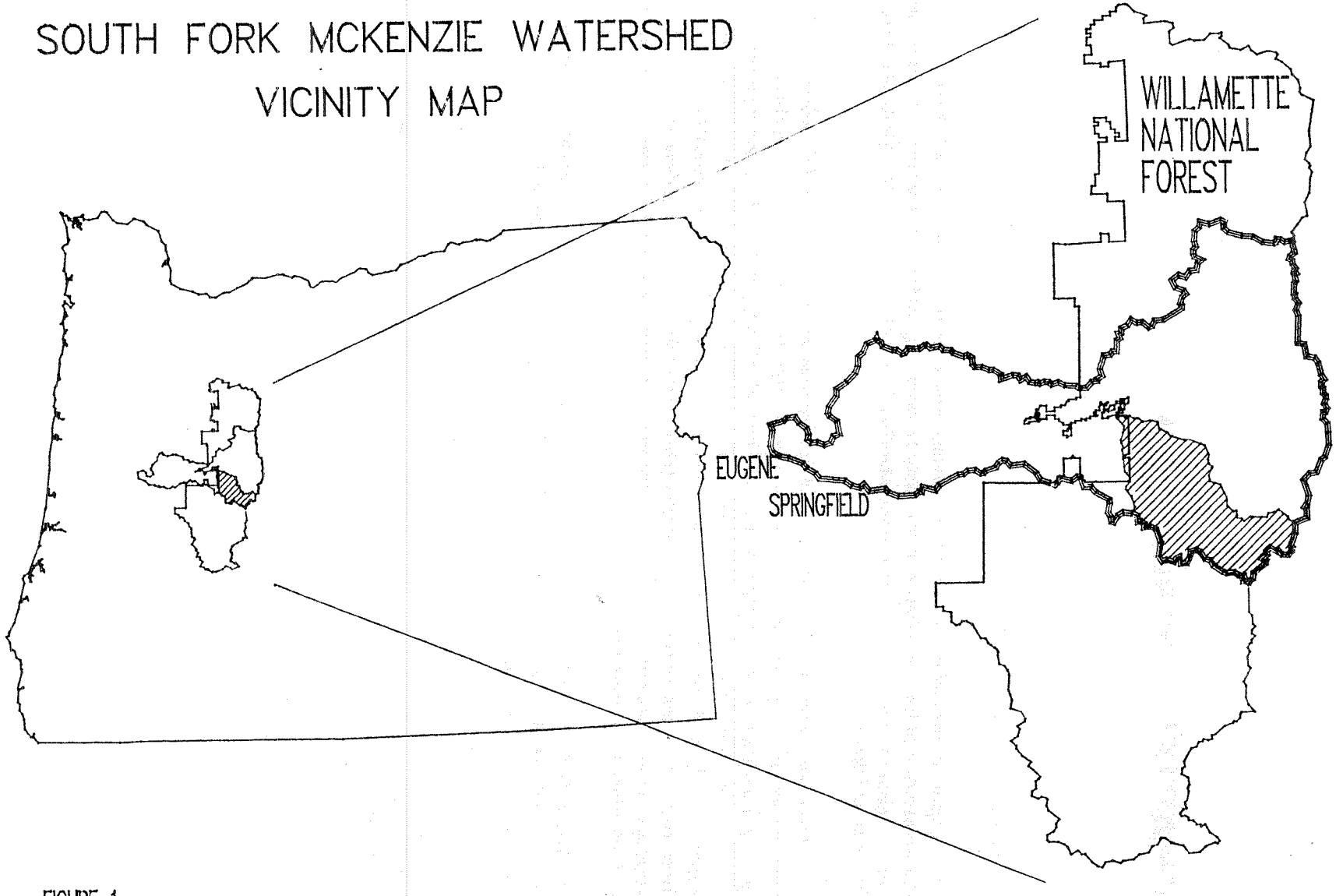


FIGURE 1

MANAGEMENT DIRECTION

The Willamette National Forest Land and Resource Management Plan of 1990 (Forest Plan), as amended by the Record of Decision (ROD) and the Standards and Guides for the Supplemental Environmental Impact Statement on Management of Habitat for Late-Successional and Old-Growth Forest Related Species Within the Range of the Northern Spotted Owl (FSEIS) provides the management direction for Forest Service lands within the South Fork (Table 1, Figures 2 and 3). In essence the direction comes from the Forest Plan and the ROD. The ROD does not update all land allocations and standards and guidelines in the Forest Plan. Only the existing Forest Plan standards and guidelines in conflict with the ROD are replaced. Management allocations as defined by the Forest Plan and updates by the ROD (Table 1) are mapped to show spatial distribution (Figures 2 and 3).

MANAGEMENT DIRECTION

1990 Willamette Forest Plan	Acres	As Amended by ROD	Acres
Private	3,064		3,064
Water	1,135		1,135
No Harvest Alloctions			
Wilderness	69,554		69,554
Includes Recreation Emphasis	13,000		13,000
Special Interest Areas, Research			
Natural Areas, Special Wildlife			
Habitat Areas, and Old Growth Groves			
		Late Successional	9,137
		Reserves	
Riparian Reserves	3974	Riparian Reserves	20,378
Harvest Allocations			
Scenic Emphasis	31,049	Matrix	21,255
General Forest	15,747	(Overlays Scenic	
		and General Forest)	
TOTALS	137523		137,523

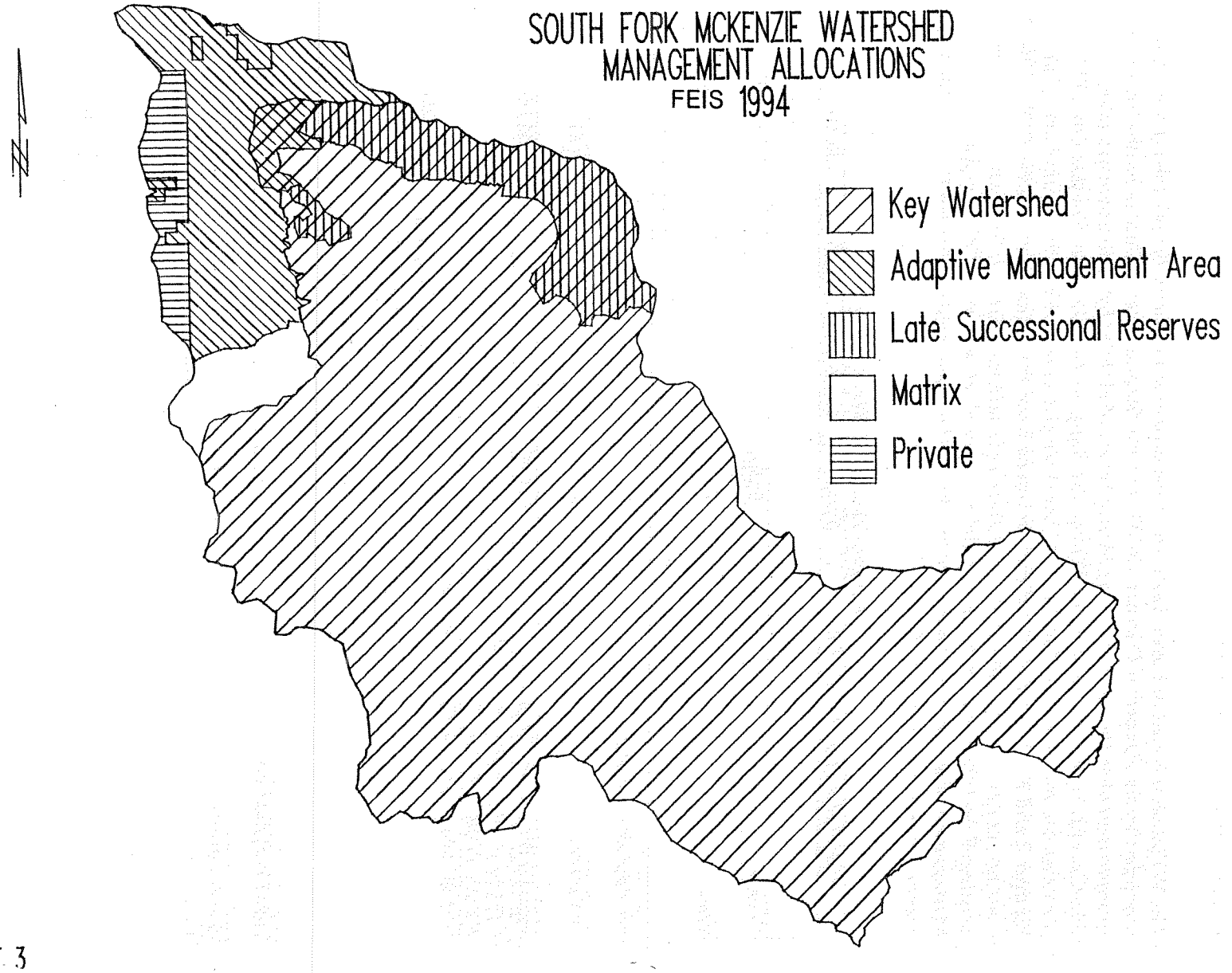
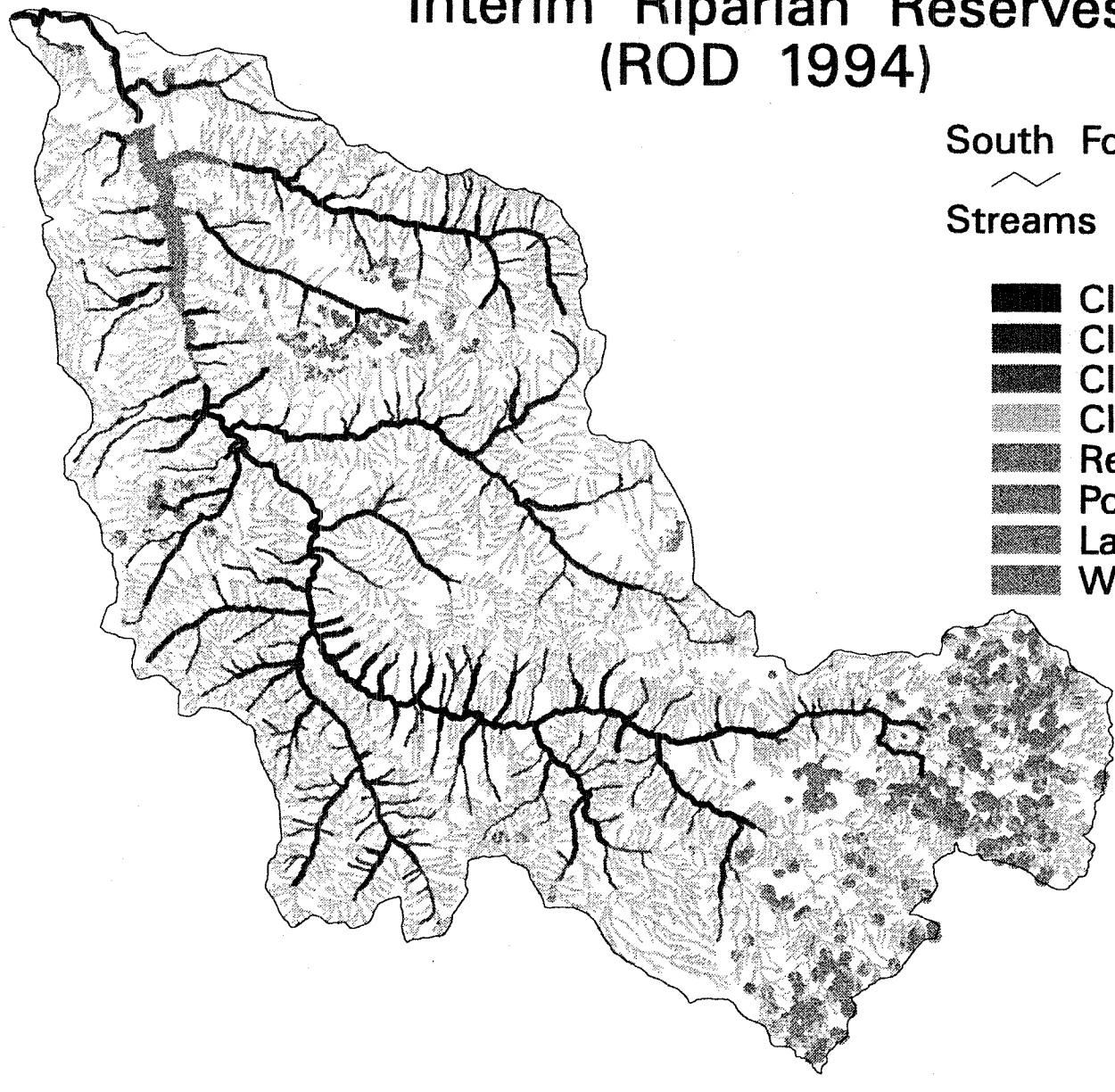

SOUTH FORK MCKENZIE WATERSHED
MANAGEMENT ALLOCATIONS
FEIS 1994
N
Key Watershed
Adaptive Management Area
Late Successional Reserves
Matrix
Private

FIGURE 3

Interim Riparian Reserves (ROD 1994)



South Fork boundry

Streams & Lake buffers

- Class I
- Class II
- Class III
- Class IV
- Reservoir
- Ponds
- Lakes
- Wet Habitat

SOUTH FORK WATERSHED MANAGEMENT AREAS 1990 Willamette Forest Plan

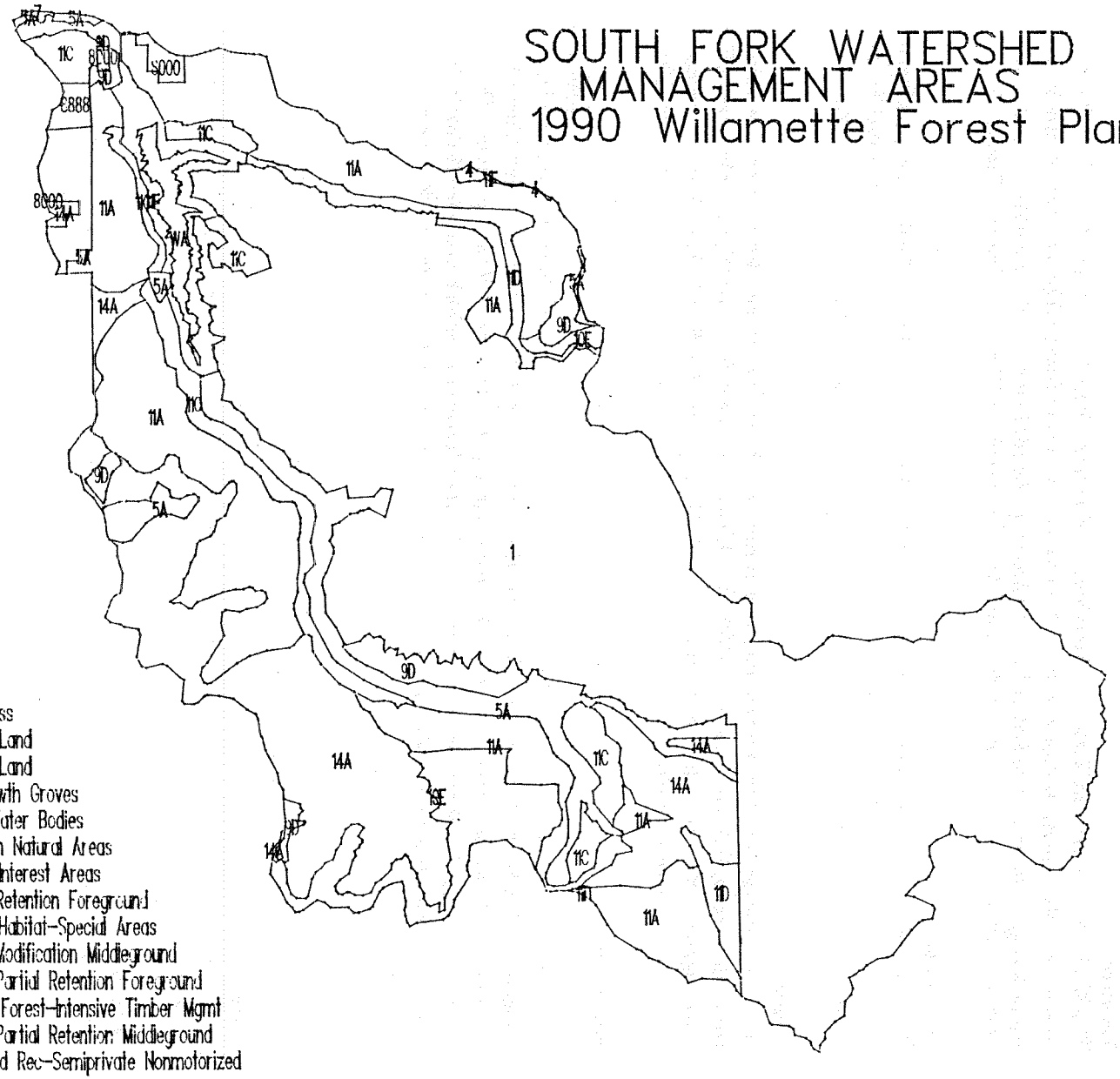


FIGURE 2

	ACRES	
1	69551	Wilderness
8000	1810	Private Land
8888	386	Private Land
7	42	Old Growth Groves
WA	1134	Major Water Bodies
4	117	Research Natural Areas
5A	6152	Special Interest Areas
11F	2788	Scenic-Retention Foreground
9D	2202	Wildlife Habitat-Special Areas
11A	22854	Scenic Modification Middleground
11D	2392	Scenic-Partial Retention Foreground
14A	17369	General Forest-Intensive Timber Mgmt
11C	5363	Scenic-Partial Retention Middleground
10E	4507	Dispersed Rec-Semiprivate Nonmotorized

THE WATERSHED SETTING

Location:
The South Fork of the McKenzie Watershed, in Western Oregon, encompasses 137,540 acres within the Willamette National Forest. It is located south of State Highway 126 on the Blue River Ranger District. The South Fork drains into the mainstem of the McKenzie River. The McKenzie River flows into the Willamette River just north of Eugene, Oregon (Figure 1).

Ownership:
There are no human residents in the South Fork McKenzie watershed. Federal ownership is 97% of the land base. The US Forest Service manages 94% of the land, 3% is managed by the Army Corp of Engineers around Cougar Dam, and 3% is in industrial forest ownership.

Climate:
Wet, cool winters and dry warm summers typify the Pacific Maritime climate here, seasonal snowpack usually develops above 3500 feet. Elevations range from 6,000 feet at the crest of the Cascades to 1,200 feet at the confluence of the McKenzie and the South Fork rivers. Average annual precipitation is 60-80 inches, the majority of which falls between November and May.

Soil & Water:
Generally Forest soils are volcanic in origin and composed of basalts, andesites and intrusions of various kinds. The two major geologic provinces are the Western Cascades and the High Cascades. The South Fork of the McKenzie flows from its headwaters in the High Cascades Province for 16 miles where it joins with a major spring fed tributary, Roaring River. The South Fork then flows for another 12 miles to Cougar Reservoir, which is approximately five miles long, and five more miles to its confluence with the mainstem of the McKenzie for a total of 38 miles.

Vegetation:
Douglas-fir is the dominant species with western hemlock, western redcedar, incense cedar, and western white pine being the most common associates. Hardwood species also found are bigleaf maple, red Alder, chinquapin and madrone. Fire regimes have played a key role in the development of the plant communities and the wide range in age structure from early seral to old growth.

Wildlife:
The South Fork of the McKenzie watershed provides habitat for wildlife populations typical of the Willamette National Forest (WNF). There are a total of 327 vertebrate wildlife species suspected to occur on the WNF based upon existing plant series. Of the total, 290 species have habitats in this watershed. These species use terrestrial habitats for breeding, feeding, and resting at some point in their life

Fish:
There are thirteen fish species native to the area that are suspected or documented in the South Fork. These include spring chinook, "redside" rainbow trout, cutthroat, bull trout, large scale sucker, whitefish, and six sculpin species. Non-native species present are brook trout which are generally found in high lakes and the Cape Cod strain of rainbow trout which are stocked in the South Fork. The bull trout is a Forest Service sensitive species and has been found eligible for listing under the Endangered Species Act.

People:
Human use of lands and resources in the South Fork date back to prehistoric and historic times. More recent populations utilize forest lands different from the prehistoric populations. Today the South Fork is used for both recreation and employment opportunities. There is a wide spectrum of recreation opportunities ranging from primitive to roaded settings. Employment opportunities include the forest products industry as well as guiding and packing.

THE LARGER SETTING

It is important to understand how a particular watershed "fits into the big picture" to help determine it's role in larger context issues. Understanding this context will help with determining the uses and values and identifying the proper scale at which to answer certain questions. In addition, the condition of the surrounding area will influence patterns and processes at work within the South Fork. To date there are no River Basin or Subbasin level plans to which to tier for this context. There are, however, a myriad of other kinds of plans at all levels from Regional to Forest. Many of these plans have identified issues and uses at the larger scales. What follows is a brief overview of the larger setting in which the South Fork resides.

Location:

The South Fork is part of theMcKenzie River Subbasin which is in turn part of the Willamette River Basin. TheMcKenzie River Subbasin contributes the majority of the context for the South Fork. There is a Watershed Council for theMcKenzie River Subbasin which has been in existence since June 1993. The purpose of this group is to address issues affecting the watershed in a comprehensive way. Council partners include 13 representatives from local agencies and interests along with two state and three federal representatives. The issues generated from this group helped create theMcKenzie River Subbasin level context.

There are larger scale issues, specifically water, fish and wildlife that will be addressed at the Willamette River Basin level as well.

Ownership:

Ownership within theMcKenzie River Subbasin (Figure 4) shows USFS 61%, BLM 6%, other government 1%, industrial forest land 22%, and other private 10% (Purnell et al. in prep).

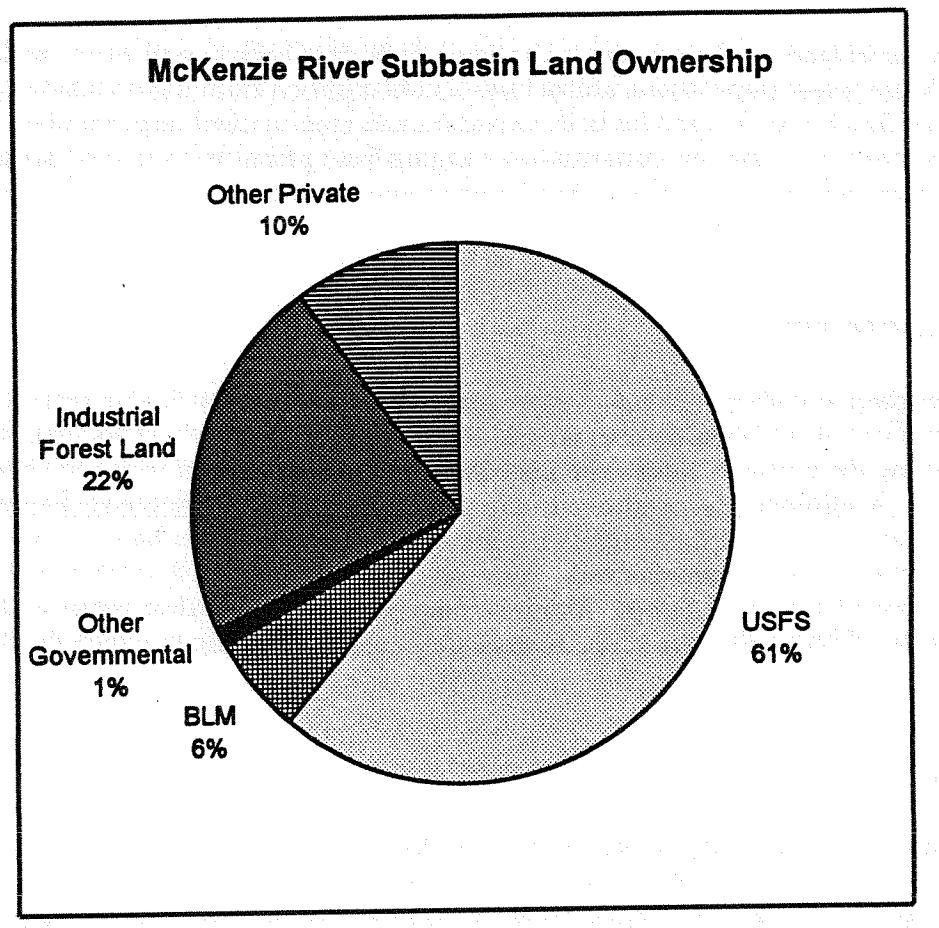


Figure 4

Water:

The South Fork McKenzie represents 16% of the McKenzie River Subbasin. The McKenzie River is a major tributary of the Willamette River, with a basin of approximately 873,000 acres. Arising from spring-fed headwaters in the High Cascades, the cold waters descend from the plateau's fresh volcanics, through glacial deposits, the older Western Cascades and on to the lower valley, passing through Springfield before joining the Willamette north of Eugene. The water of the McKenzie River is one of the most cherished resources of the subbasin. In addition to providing habitat for fish and other aquatic species the McKenzie provides drinking water for over 200,000 people.

Five dams lie within theMcKenzie River Subbasin, three on the mainstem, and two on tributaries. One of the tributary dams is Cougar Dam which is on the South Fork McKenzie. There are eight additional dams in the Willamette Basin for a total of thirteen. These dams were constructed for flood control purposes in the Willamette Valley. During the season of major floods which extends from November through early February, a maximum of flood control storage space is provided. Starting in February as the storm activity begins to decrease in intensity and frequency, the space reserved for flood control storage can be gradually filled. Flood control regulation is based primarily on downstream channel capacities and reservoir storage space available. (US Army Corps of Engineers, 1989.) The dams also supply hydroelectric power which is sold to the Bonneville Power Administration and is incorporated into the pacific northwest power grid. During the months of low precipitation and streamflow, releases are made to satisfy the requirements of irrigation, as well as other uses.

Augmented flows released from the reservoirs during the months of low precipitation and streamflow maintains water quality through dilution of the Willamette River to meet DEQ standards (dissolved oxygen, temperature, dissolved solids) downstream from Corvallis to Portland.

Fish:

Twenty-three fish species are native to theMcKenzie River Subbasin (Appendix Table FW1), thirteen of which are suspected or documented in the South Fork watershed. There is some understanding of the natural history and diversity of these species throughout their ranges, however knowledge is continually being gained. More is known about salmon and trout which are of cultural or economic value.

One species identified as eligible for listing under the ESA, bull trout, and one species identified as a "stock-at-risk", Willamette spring chinook, are native to the South Fork McKenzie and will be covered in this analysis. Other fish species are not the focus of this watershed analysis, because too little is known about them (e.g. sculpin and whitefish populations), or their populations are thought to be stable and able to successfully maintain a viable population in the South Fork McKenzie watershed (e.g. resident rainbow trout and cutthroat).

People

In 1990, 22,648 people lived in theMcKenzie River Subbasin; 9,512 in rural areas and 13,136 in urban areas (McKenzie Council 1994).

Development along the river is widespread and growing. Demands on the recreational aspects of the area are growing as well. People use the McKenzie for a variety of recreation uses including but not limited to fishing, hunting, hiking, biking, photography, picnicking, boating and swimming. Fishing, boating and picnicking seem to be the most popular uses.

There is concern about recreation opportunities and how they affect private land and also about how concentrated recreation use affects the resources.

Land Uses

Within the McKenzie River subbasin about 34,000 acres are in agriculture, 9,000 acres are in residential use, and 1,000 acres are in industrial use. The remaining 90-95% is in forest uses (McKenzie Council 1994).

Harvestable forest lands (industrial forest plus federal lands in allocations allowing scheduled harvest) account for half (49%) of theMcKenzie River Subbasin. Industrial forest companies control approximately 45% of the harvestable base. These figures are approximate due to portions of industrial forest land subject to restrictions on harvest, such as riparian buffer zones, and some acres small woodland owners may log. One third of USFS lands within the basin are in harvest allocations, but only one quarter of USFS lands in the South Fork McKenzie watershed are outside of wilderness or other reserves.

Wildlife

Within the entireMcKenzie River Subbasin wildlife habitats have been significantly disturbed through time, especially along the riparian section from Cougar Dam down to the confluence of the Willamette River. Timber harvest and other public use of the uplands from Blue River and downstream have also changed the habitats from predominant late seral (old growth) to the early and mid seral managed stands that exist today. The exception is where historical fires maintained early seral habitats in the lower elevations of the valley. These changes only begin to describe the magnitude of impacts on the native fauna of this riparian area, and at the same time accentuate the value of remaining native habitats in the South Fork.