A black and white photograph of a forest stream. A large, weathered log lies across the middle of the stream, creating a small waterfall or rapids. The water is turbulent and white with foam. The surrounding forest is dense with evergreen trees and undergrowth. The lighting is dramatic, with strong highlights on the water and the log, and deep shadows in the forest.

Rigdon Ranger District
Willamette National Forest

August 1995

Watershed Analysis Report

Middle Fork Willamette River
Downstream Tributaries Watershed



Watershed Analysis Report

Middle Fork Willamette River Downstream Tributaries Watershed

**Rigdon Ranger District
Willamette National Forest**

August 1995

**For further Information Contact: Rigdon Ranger District
Willamette National Forest
P.O. Box 1410
Oakridge, Oregon 97463
(503) 782-2266**



United States
Department Of
Agriculture

Forest
Service

Willamette
National
Forest

Oakridge Ranger District
46375 Highway 58
Westfir, Oregon 97492
Telephone (503) 782-2291

Caring for the Land and Serving People

Reply To: NFEM

Date: Feb. 9, 1995

Subject: Project Initiation Letter
Lower Middle Fork Willamette Watershed Analysis

To: Watershed Analysis Team

Proposed Action: Conduct a watershed analysis for the Lower Middle Fork of the Willamette watershed including appropriate private land.

Purpose and Need: The Amended Willamette N.F. Land and Resource Management Plan requires watershed analysis as the basis for project level analysis and informed decision-making to support a wide range of activities accomplishing ecosystem management.

Preliminary Issues: Major watershed processes, travel and access management, wood fiber production, and the integration of forest management activities with local Community Strategic Action Plans.

Information: Use the South Fork McKenzie Pilot Watershed Analysis, Staley Ck. Watershed Analysis and any other pilot Watershed Analysis as guides to develop our model. Use existing information, such as the Middle Fork Watershed Assessment completed in FY 94 as part of the watershed restoration program and any other appropriate materials wherever possible to meet the needs of this analysis. Limit collection of new information and/or inventories on the purpose of the analysis, desired products, available budget, and the timeline to complete the analysis.

Schedule: Complete the analysis and documentation by June 30, 1995. This timeline assumes that all funded, high priority projects dependent on this analysis can be accommodated. It further assumes that individual specialists will have this work as a top priority but will be available to work on other high priority projects. If work scheduling conflicts arise, that are likely to lead to priority work not meeting schedule, I want to be involved in the decision.

Product: A documented Watershed Analysis, following the guidelines in A Federal Agency Guide for Pilot Watershed Analysis including stratification of the watershed by key processes, functions and conditions; past and current watershed conditions; watershed trends; considerations for proposed future management; and documentation of assumptions. Insure that the product meets current Forest and Regional standards and is designed as a "living document".





Collect and document information necessary to support site specific project analysis, including recreation activities, access and travel management, watershed restoration and enhancement, vegetation management including timber sales. A process must be developed for the identification of specific areas to review and/or establish Riparian Reserve boundaries.

Due to time and funding constraints, you should consider applying different analysis emphasis to different geographical areas based on the key questions.

Team: Resources represented on the Core Team will include Wildlife (Ken Kestner), Fish (Denise Hann), Soils and Geology (Mark Leverton), Hydrology (Maureen Campbell), Social and Recreation (Frank Carson), Vegetation (John Agar), Information Management Coordinator (Hal Stadel), Writer/Editor and Team Coordinator (Leslie Heaton). Additional resources assigned to this project include GIS (Laura Hoffman), Fire (Chas Rassler), Botany (Ken Kestner), Transportation (Keith Wheeler), and Heritage Resources (Jane Agar). Additional skills may be assigned as needed. The COE has been invited to participate in this effort. To the extent they are able I want them to participate as full team members.

Potential Public and other Agency Information Sources: Community leaders, share cost partners and other private forest industry landowners, Oregon Department of Fish and Wildlife, U.S. Army Corps of Engineers, Oregon Department of Forestry, Soil Conservation Service/Resource Conservation and Development District, U.S. Fish and Wildlife Service, National Marine Fisheries Service, Oregon State University, PNW Forest and Range Experiment Station, representatives from environmental and recreation user groups and partners.

Initial Activities: Discuss and understand this assignment, confirm Team composition, identify major tasks, identify additional skills necessary in addition to those specified, develop a rough timeline for activities, and identify funding needs. I would like this step done, as much as possible, prior to our joint meeting with Lowell and Oakridge Ranger Districts on Feb. 16.

Checkpoints with the District Ranger:

Identification of: Initial Activities including Schedule,*
Issues and Key Questions,*
Information Needs Analysis,
Public Involvement Plan
Step 4 of New Guidelines (Benchmarks)
Findings and conclusions.*

Periodic Updates.

The Forest Supervisor must be invited to participate in those items identified by an *.


ROBERT L. BARSTAD
District Ranger


RICK SCOTT
District Ranger



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Abbreviations and Acronymns

APHIS	Agricultural Plant Health Inspection Service
BLM	Bureau of Land Management
C&H	Cattle and Horse
COE	Corps of Engineers
DEQ	Department of Environmental Quality
GIS	Geographic Information Systems
HEI	Habitat Effectiveness Index
LSR	Late-Successional Reserve
LSRS	Late-Successional Reserve for the Northern Spotted owl
LWM	Large Woody Material
MFW	Middle Fork Willamette
MFWDT	Middle Fork Willamette River Downstream Tributaries Watershed
NF	National Forest
OCMWR	Oregon Central Military Wagon Road
ODFW	Oregon Department of Fish and Wildlife
PAOT	Persons At One Time
PSQ	Probable Sale Quantity
R6	Region 6
ROD	Record of Decision
RVD's	Recreation Visitor Days
S&MS	Survey and Manage Species
SIA	Special Interest Area
TE&S	Threatened, Endangered and Sensitive
TSI	Timber Stand Improvement
TSZ	Transitional Snow Zone
USBF	United States Bureau of Fisheries
USDA	United States Department of Agriculture
USFS	United States Forest Service
USFWS	United States Fish and Wildlife Service
USGS	United States Geologic Survey
WNF	Willamette National Forest



Introduction

Middle Fork Willamette River Downstream Tributaries Watershed

This introduction describes the purpose, scope and objectives of the Middle Fork Willamette River Downstream Tributaries Watershed Analysis. It defines the issues addressed in the analysis.

Purpose Of The Watershed Analysis

The purpose of the Middle Fork Willamette River Downstream Tributaries (MFWDT) Watershed Analysis is to develop and document the processes and interactions occurring within this Watershed. This information will be the basis for future project level analysis. The analysis will assist the decision makers in selecting a wide range of activities that accomplish ecosystem management.

Scope And Objectives

The analysis will answer questions relating to the identified issues of concern for the MFWDT Watershed. The report will collect and document information necessary to support future site specific project analysis.

Potential Future Projects

- recreation activities
- an access and travel management plan
- restoration and enhancement projects
- vegetation management activities
- riparian reserve management activities

The report is in loose-leaf binder for ease in updating and revising the analysis as new or different information becomes available.

Tiering

At the Forest level, this analysis is tiered to, *The Willamette National Forest Land and Resource Management Plan, amended by the Final Supplemental Environmental Impact Statement on Management of Habitat for Late-Successional and Old-Growth Forest Related Species Within the Range of the Northern Spotted Owl*, hereafter referred to as the Forest Plan (USDA,1994).

The Middle Fork Willamette Downstream Tributaries Watershed has had several recent analyses completed. *The Analysis of the Coast Fork and Middle Fork of the Willamette River* (USFS,1994) provides a view of the landscape at the river basin scale. The *1994 Preliminary Assessment of the Middle Fork of the Willamette River Watershed Restoration* (USFS,1994) was completed as part of an effort to provide local employment opportunities for the Jobs in the Woods program. *The Middle Fork Willamette River Downstream Tributaries Watershed Analysis* (USFS,1995) was completed as an abbreviated watershed analysis to provide management guidelines until a more intensive analysis is complete.

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Methodology

The draft document *Ecosystem Analysis at the Watershed Scale: The Revised Federal Guide for Watershed Analysis, version 2.1*, hereafter referred to as the *Ecosystem Analysis Guide* provided guidance for our analysis (USFS, et al, 1995). A variety of sources, including GIS tools, PC programs and databases, were used in acquiring information for this document.

Definition of Issues

The issues were initially developed in conjunction with the North Fork Willamette Watershed Analysis Team on February 9, 1995. Several iterations of those original issues have occurred with the MFWDT Watershed Team. Chapter 2 describes the issues in detail. The following gives a brief introduction to the concerns in this Watershed.

Intensity And Pattern Of Vegetation Manipulation

The intensity and pattern of vegetation manipulation activities across the landscape have resulted in vegetation patterns outside the range of natural conditions.

Exclusion Of Natural Fire

The exclusion of wildfire has altered the vegetation pattern and diversity of the forest structure. The exclusion has allowed an increase in fuel loadings.

Transportation System

Many roads in this Watershed have exceeded their designed service life and are in varying stages of deterioration. This may create detrimental environmental conditions. Existing stream crossing structures that pose a substantial risk to riparian conditions are to be improved to accommodate at least a 100-year flood event. Roads affect the habitats of both plants and animals. Roads also provide a transport mechanism for non-native plants.

Introduction And Spread Of Non-Native Species

The introduction and spread of non-native species may affect the viability of Threatened, Endangered or Sensitive species and native natural habitats.

Infrastructure

The existing facilities and associated activities may affect the Watershed resource values and processes.

Hills Creek Dam And Lake

Hills Creek Dam has affected the hydrologic regime, terrestrial and aquatic ecosystem, and the stream channel and flood plain morphology. Bull trout distribution has been impacted. Spring Chinook spawning habitat has been impacted. Types of recreation use are affected by Hills Creek Lake pool levels.

Chapter 1

Characterization

Middle Fork Willamette River Downstream Tributaries Watershed

This chapter provides a description of the physical, biological and social features of the Watershed.

Physical Features

Location

The Middle Fork Willamette Downstream Tributaries Watershed is in eastern Lane County and northern Douglas County, Oregon. It is a portion of the headwaters of the Middle Fork Willamette Sub-basin of the Willamette Basin, which is part of the Columbia River system (Figure 1). It extends from the Calapooya Mountains to the city of Oakridge and from Staley Creek west to the boundary of the Umpqua National Forest. Included in this Watershed are the majority of Hills Creek Lake and Dam, a portion of the Middle Fork Willamette River (MFW), and the city of Oakridge. Four Subwatersheds compose the MFWDT Watershed (Figure 2).

Hills Creek Dam, on the north central boundary of the Watershed, controls the flow of the MFW River downstream. Construction began in 1959 and was completed in 1963. Hills Creek Lake has a storage capacity of 234,300 acre-feet and covers approximately 2,735 acres. The MFWDT boundary does not include the Hills Creek Arm of the lake.

The Watershed covers approximately 110,000 acres. Eighty-six percent of the land is the Willamette National Forest. The Corps of Engineers administers some land adjacent to and downstream of Hills Creek Dam.

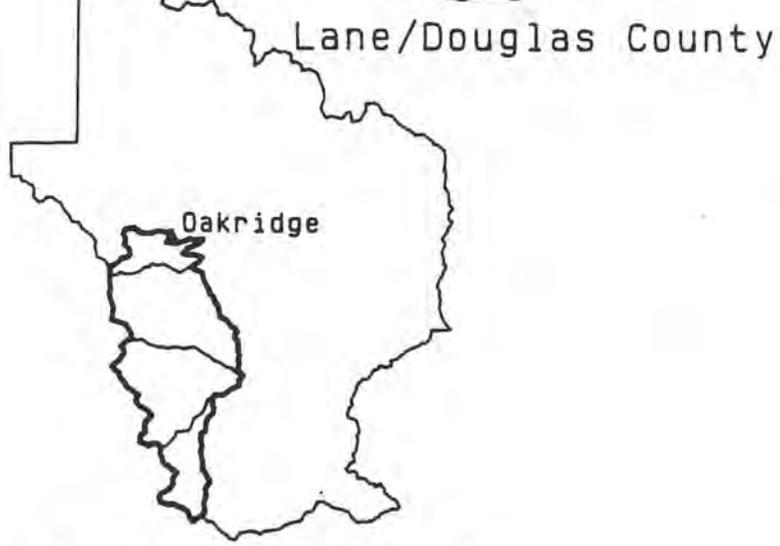
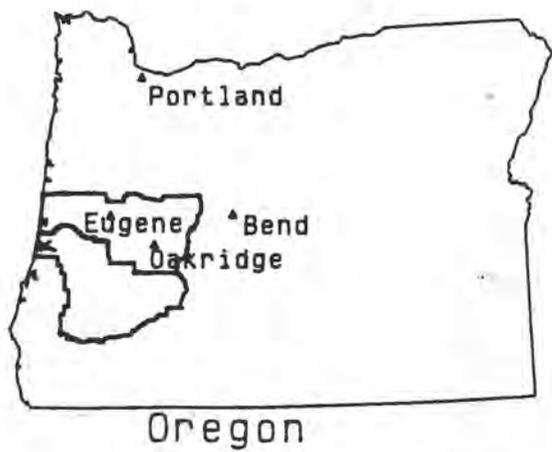
The majority of the remaining land is the city of Oakridge and timber lands owned by Seneca Jones Timber Company. A contiguous block of about 9300 acres of Seneca land falls within the western portion of the Watershed.

The Forest Plan established various land allocations within the MFWDT. Figures 3 and 4 display the location of the areas. A Late-Successional Reserve (LSR) incorporates much of the western and southern side of the Watershed. LSR 0222 acreage includes the 100 acre LSRS's in Table 1. Riparian Reserves cover a large area of all of the allocations. The acres of Forest Matrix lands exclude the LSRS's. A summary of allocation acres is in Table 1.

Table 1: Acres by Allocation

FOREST PLAN ALLOCATION	ACRES
LSR and LSRS	44,300
Forest Matrix	47,960
Hills Creek Lake	2,240
Corps of Engineers	360
Private Land	15,140
Total Watershed	110,000

Figure 1: Middle Fork Willamette Downstream Tributaries
Vicinity Maps



Middle Fork Willamette
Downstream Tributaries Watershed

Figure 2: Middle Fork Willamette Downstream Tributaries
Subwatersheds

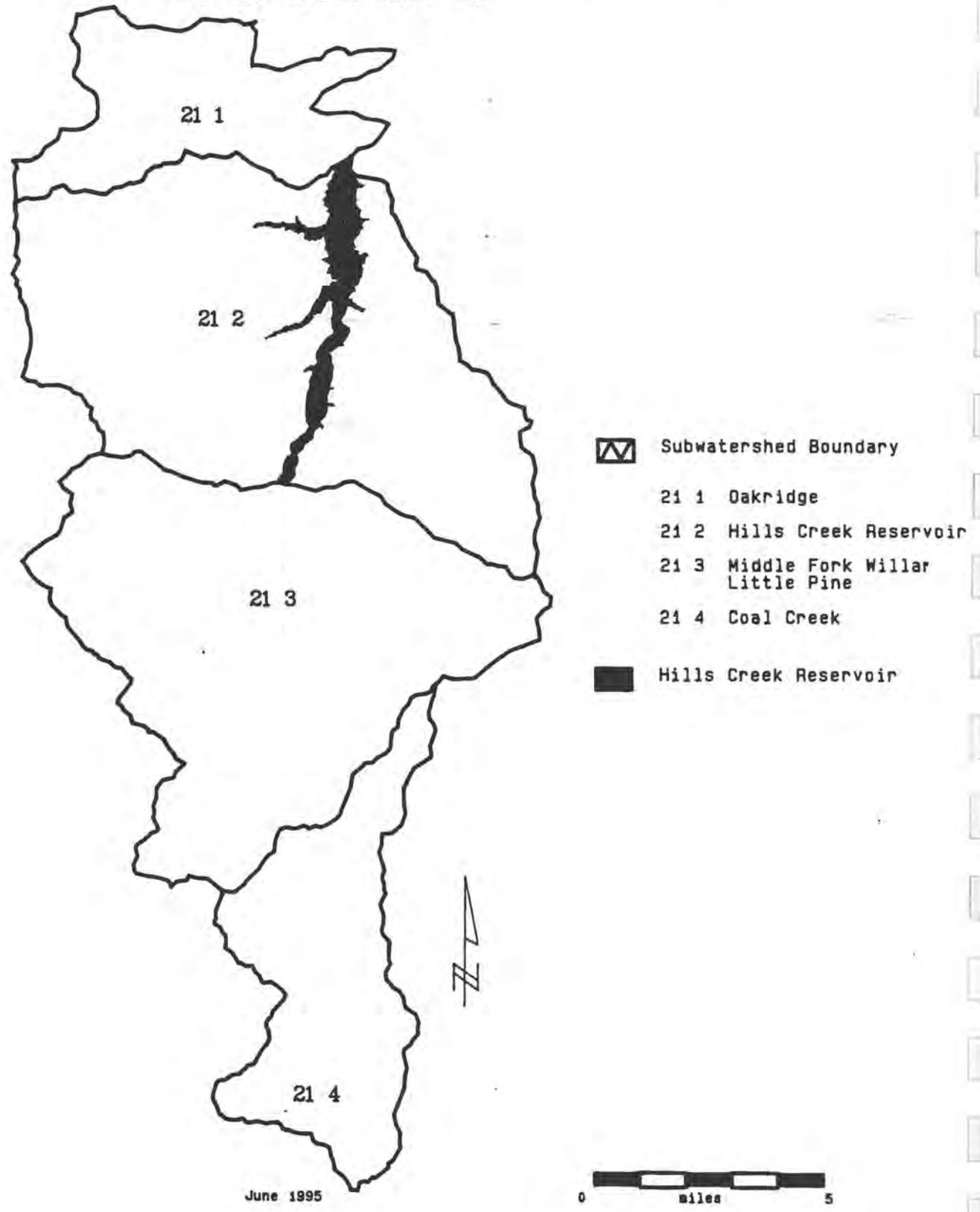
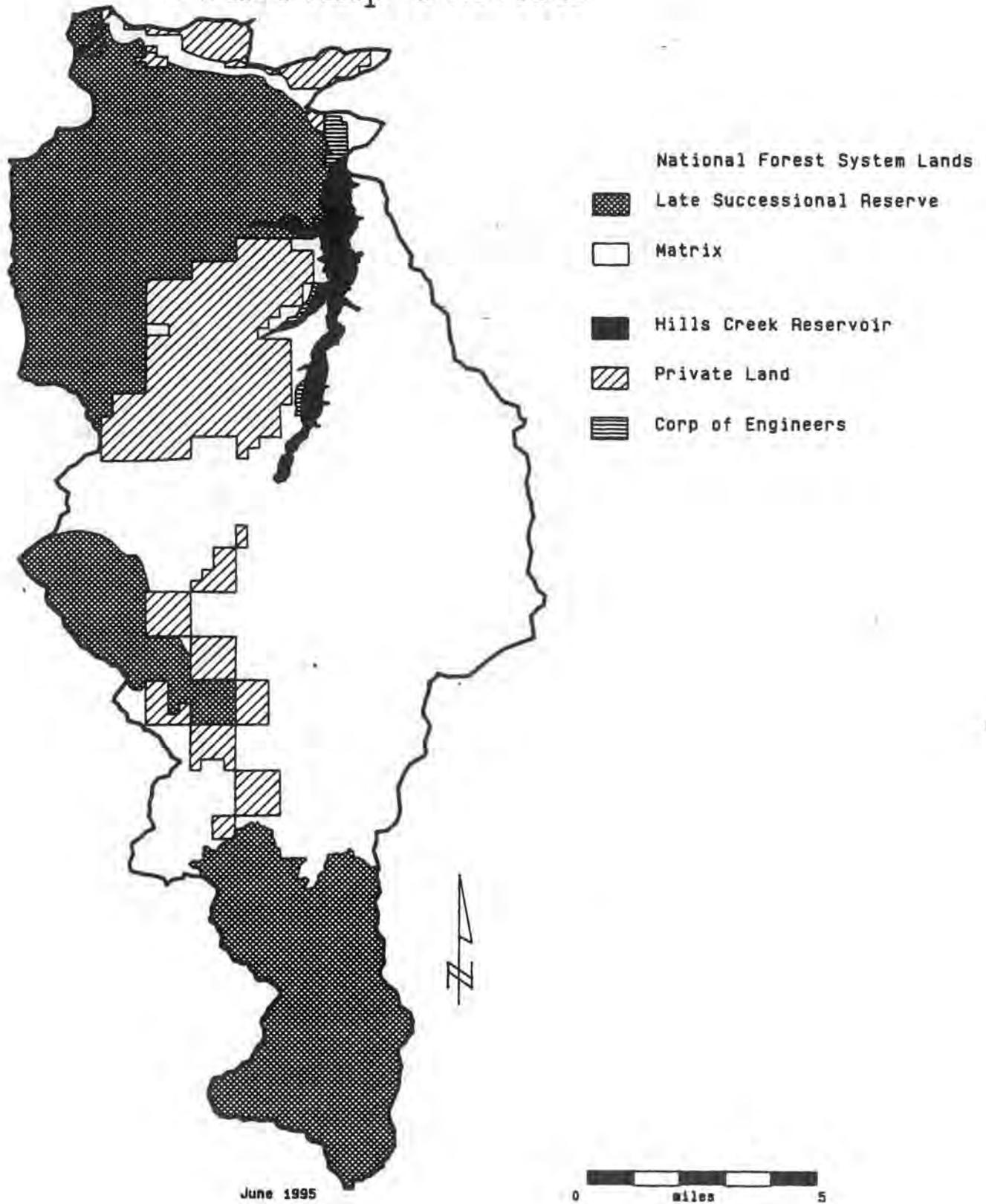


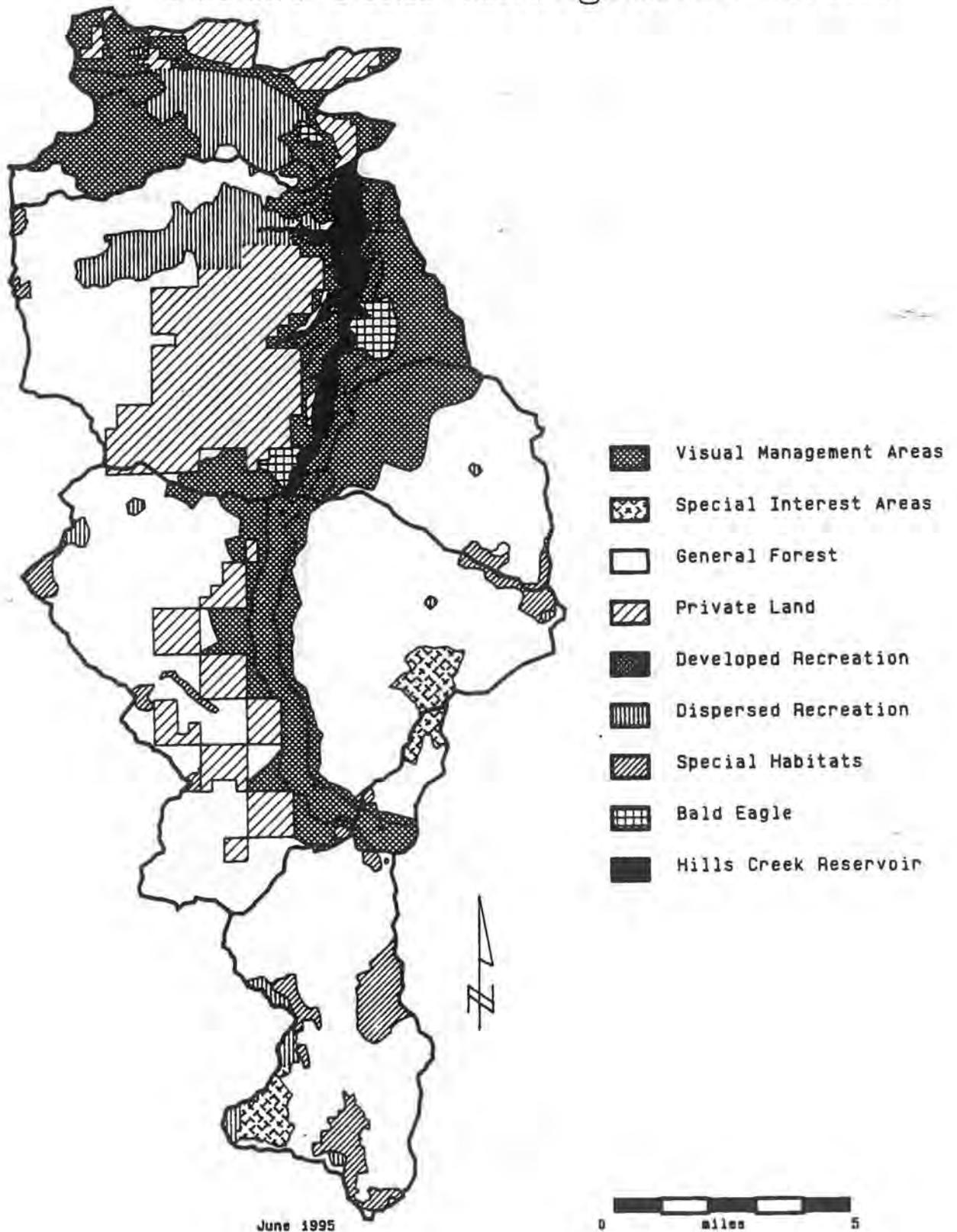
Figure 3: Middle Fork Willamette Downstream Tributaries
Ownership Pattern



June 1995

0 miles 5

Figure 4: Middle Fork Willamette Downstream Tributaries
Forest Plan Management Areas



Geology and Soils

The Watershed lies within the Western Cascades subprovince of the Cascade Range. The area divides into a north and south section by imagining a line connecting Bearbones Mountain, Joe's Prairie and Buck Mountain. Pyroclastic rocks with minor amounts of lava flows and intrusions primarily compose the northern area. The southern area is predominantly of basaltic and andestic lava flows.

Remnants of alpine glaciation are evident in the southern reaches of Coal Creek and the upper end of Buck Creek in the Warner Mountain area. Broad U-shaped valleys are being reshaped by streams that are modifying the valley configuration by either incising downward as in Coal Creek or eroding headward as in Buck Creek. Another less obvious remnant of alpine glaciation is the tremendous amount of cobble and boulder-rich alluvium that occupies the Middle Fork Willamette River channel and sideslopes.

Road construction has had a great impact in activating mass movements beyond the natural erosion cycle. The highest frequency of road related failures on the Rigdon Ranger District occur within the MFWDT Watershed.

Climate

The Watershed has the typical Pacific Maritime climate with wet, cool winters and dry, warm summers. The southern portion of the MFWDT exhibits more dry site conditions than the rest of the WNF due to the influence of the Calapooya Mountains. Elevation ranges from 1200 feet at Oakridge to 6130 feet near the southern portion of the Watershed. Average rainfall is approximately 40 inches per year in the city of Oakridge. The higher elevations receive up to 70 inches of rainfall per year (WNF, 1981).

Hydrology

The Middle Fork Willamette River Downstream Tributaries is typical of many western Cascades Watersheds. Approximately 78% of the MFWDT is in the transitional snow zone (TSZ) where rain-on-snow events are common. This high percentage makes rapid flood peaks and high flows associated with rain-on-snow events a dominant hydrologic process in the Watershed.

Biological Features

Terrestrial Vegetation

The MFWDT Watershed has the 5 major conifer series that exist on the Willamette National Forest. The series, listed in order from the most common to the least common, are: Western hemlock, Douglas-fir, Pacific silver fir, grand fir, and mountain hemlock. The understory species are typical of Western Cascade forests. Rigdon Ranger district has significantly drier climatic conditions than the rest of the Willamette National Forest.

The Western hemlock series is located throughout the entire Watershed at low to mid elevations.

Douglas-fir series occur on warm, relatively dry sites at lower elevations on south and west slopes. This series is a northern extension of the Sierran mixed conifer forests common in the southwestern Oregon Cascades, Siskiyou Mountains, and Sierra Nevada Range (Franklin and Dyrness, 1973). This is the driest environment capable of supporting a closed forest canopy on the Willamette and is rare north of the McKenzie River. A unique feature for this series in the MFWDT is the ponderosa pine band in the lower Youngs and Deadwood Creek area. The ponderosa pine band follows a lower precipitation area that goes up the MFW River.

Pacific silver fir series dominate the upper slopes above 4000 feet. This series is predominate in the Warner Mountain-Groundhog area, Bristow Prairie, Gertrude Lake area and Steeple Rock.

Grand fir series tend to dominate the relatively well drained and dry slopes from 1800 to 4500 foot elevation. Mountain hemlock series dominate the cool, wet upper ridges and flats as in Upper Coal Creek.

Non-forested habitats contribute significantly to plant and animal diversity across the MFWDT. Concentrations of rock outcrops, rock gardens, meadows and ponds are in the higher elevations.

Vegetation and Fire

Past forest fires were instrumental in shaping the pattern of vegetation in the MFWDT. Approximately 80 percent of the Watershed has had some type of fire at one point in time. Stand replacement fires are now significantly less frequent and smaller than they were between the years of 1680 through 1918. The exclusion of wildfire from the ecosystem through modern fire suppression techniques changed the vegetative pattern of the landscape and increased fuel loading due to less frequent underburning. The most recent large fire was

Shady Beach Fire. It burned over 9,000 acres in the fall of 1988. Approximately 3,300 acres are in this Watershed.

Riparian Conditions

Riparian vegetation conditions vary on National Forest lands because of past management practices, floods, mass movement events, and fire history. Past timber management practices have been a factor in the decrease of the large wood component of the stream system and the removal of riparian vegetation. Maximum stream temperatures on many streams do not meet Oregon water quality standards, primarily due to removal of shade producing riparian vegetation and channel widening (USFS, BLM, COE, 1994).

Reforestation history

Incidental harvesting of timber began with early settlements in the 1850's. Harvest concentrated along the Free Emigrant Route that later became the Oregon Central Military Wagon Road (OCMWR). Increased harvest began in the late 1940's with associated increase in the transportation system. Heavy harvest of the east 1/3 of the Watershed occurred because of easy accessibility.

Harvest levels were about 2500 acres by decade in the late 1940's and 1950's and rose to a peak of 7900 acres in the 1980's. Regeneration cuts were mainly clearcuts with broadcast burning used for site preparation. Burning has been reduced to meet air quality standards. Regeneration harvest with reserves have replaced clearcuts as the method of harvest.

Early reforestation was natural or aerial seeding. Planting of seedlings replaced the early techniques to increase reforestation success.

Botanical Species

The MFWDT has two known sites of Thompson's mistmaiden, an R6 Sensitive Species. This is an annual mistmaiden found in rock garden and rock outcrop habitats (Dimling, 1995).

Several rare and unique species are in the Watershed. Of special interest are species usually found in the desert foothills and mountains on the east side of the Cascade Mountains. Other species of interest are those with populations reaching the ends of their range. A mountain mahogany, from the Moon Lake Special Interest Area, wapato from the edge of Bradley Lake and the large-flowered brickellia are the only known populations of these species on the Willamette National Forest (Dimling, 1995).

A Survey and Manage Species (S&MS), the candystick, is an old-growth dependent species found in the MFWDT.

Moon Point and Bradley Lake are two Special Interest Areas (SIA) in the MFWDT. Both were designated SIA's because of their botanical richness.

Non-Native Species

A number of established populations of noxious weeds are in this Watershed. They include Scotch broom, tansy, St. John's-wort and thistles. Little Groundhog Meadow is an extreme example of St. John's-wort outcompeting the native species. This has caused a severe reduction in the biological diversity of the site. Newly invading weeds include spotted and diffuse knapweed and giant knotweed.

Bullfrogs and barred owls are non-native wildlife species of concern in the MFWDT.

Calapooya Mountains

The Calapooyas are a unique feature in the Watershed. They essentially ring the southwestern and southern part of Rigdon Ranger District. They form a physical and climatic barrier for plant species migrating south, north and west. The Calapooyas could act as a refugia for species during global climatic change because of the range of habitat types and species (Dimling, 1995). They function as a rain shadow allowing establishment of dry site species.

Terrestrial Wildlife

Habitat conditions are the prime determinants of wildlife species and numbers. Species of concern found within the MFWDT are Northern Spotted owls, Bald eagles, Peregrine falcons, western pond turtles, red-legged frogs, and tailed frogs. The Townsend's big-eared bat, the Great Gray Owl, and the Harlequin duck have been seen or heard within the Watershed but without a confirmed nest site.

Roosevelt elk utilize the east side of the Middle Fork Willamette River and the Coal Creek drainage more than other areas in the MFWDT. All three management classifications of emphasis areas occur within the Watershed.

Aquatic Wildlife

Important endemic fish species in this Watershed are Spring Chinook salmon, Bull trout, and resident cutthroat trout.

Spring Chinook were the only endemic anadromous fish in the MFWDT. The Watershed historically supported about 20% of the native Spring Chinook run for the entire Willamette Basin. Blocked passage is from Hills Creek Dam in this Watershed and downstream by Dexter and Lookout Dams.

There was a historical distribution of Bull trout in the Willamette Basin. There are reports of a small adfluvial population of adults and sub-adults from Hills Creek Lake to approximately 16 miles upstream on the MFW River (Unthank and Sheehan, 1992).

Resident cutthroat trout are present in most Class II streams. The status of these populations is unknown.

Social Features

Human Use

The MFWDT has a diversity of resources ranging from abundant fish, small mammals, big game and prolific vegetation. This provided choice human habitat for at least 6,000 years. Ethnographic evidence from low elevation sites suitable for year round use, to aboriginal trails providing travel routes accessing a multitude of diverse upland resources currently remain in this Watershed.

Native Americans

Beginning at least 1,500 years ago, Kalapuyans occupied the Upper Willamette Valley and its tributaries, including the MFWDT. The Southern Molalla migrated into the Upper Willamette, pushing out the Kalapuyans after AD 1600 (Swanton 1968). The horse, acquired at white contact, enabled the Klamath Indians to travel over the Calapooya Divide via Staley Ridge and down the Middle Fork.

By 1855, most of the Indians who survived the influx of disease brought by white settlements, were relocated to reservations at Grand Ronde and Warm Springs.

Early Settlers

During the early 1800's Euroamericans began moving into the Willamette Valley. By mid-century, settlements were developing along the MFWDT.

Records indicate that several cabins existed in the area of Oakridge. To gain access to the Calapooya Divide, settlers widened existing Indian trails for their herds of livestock. Some of the trails included the Staley Ridge Trail and the trail that later became the Oregon Central Military Wagon Road (OCMWR).

The OCMWR is the most completely documented route of 19th century travel in Oregon. Initial interest in this route began in the spring of 1852 when residents of the upper Willamette Valley explored the Middle Fork trying to find a route over the Cascades. The road was to become a major route of emigration for the second generation of Oregon pioneers

By the 1870's, interest in the economic potential of the timber available in the Cascades resulted in utilization of the Middle Fork Willamette River to drive logs to mills in the Eugene area (Mason 1973).

In 1893, the Cascade Range Forest Reserve was established under the auspices of the U.S. Department of the Interior. Initially it was a closed area, but by 1897 the land reopened to settlers, miners, ranchers and lumbermen.

Early Twentieth Century

In 1908, the U.S. Forest Service created the Umpqua National Forest in the Cascade Mountains from the Cascade Reserve. In 1911, lands north of the Calapooya Divide were placed under the jurisdiction of the Cascade (now Willamette) National Forest that later included the Oakridge Ranger District. In 1947, some of the Oakridge Ranger District became the Rigdon Ranger District.

Advent of the contemporary road system and the logging truck expedited development of the Upper Willamette Valley. In the 1920's, the Westfir Lumber Company Sawmill was constructed.

Current Situation

Economics

Timber harvest volumes began to rise in the late 1960's and peaked in the middle 1980's. The economies of both Westfir and Oakridge were driven by the operation of the Edward Hines Lumber Mill and the later operation of Pope & Talbot, Inc. Lumber mill. In the early 1980's the Edward Hines Lumber Mill ceased operation. In the late 1980's, Pope & Talbot, Inc. removed all of their standing timber and divested itself of their Oakridge holdings. These mill closures ended the reliance on primary wood products. As the mills were major employers in this area, many families left in search of similar employment. The

economy began diversifying with establishment of secondary wood products industries, small business manufacturing and tourism efforts.

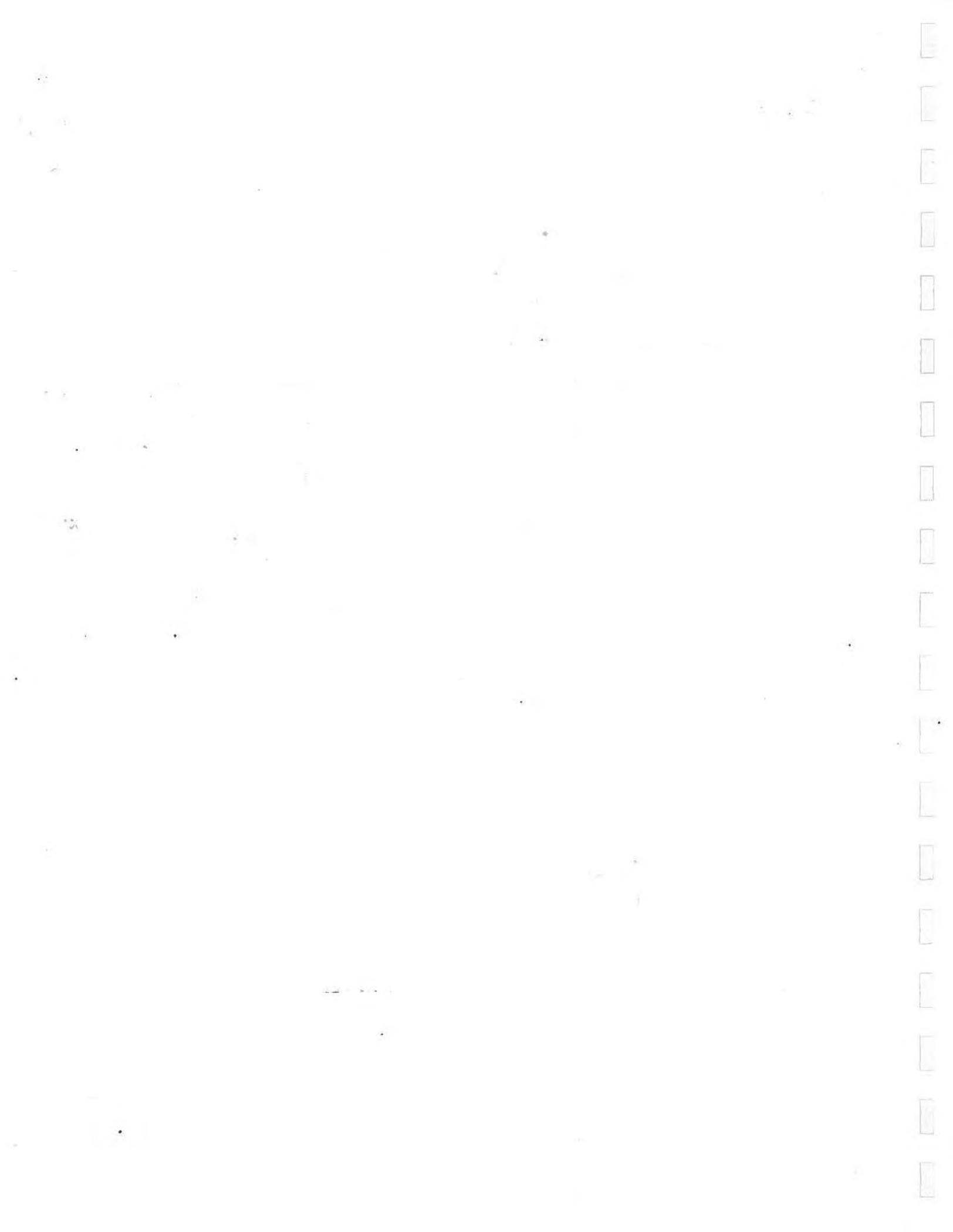
Recreation

There has been an extensive effort by the City of Oakridge to promote the city as "A recreation paradise". The MFWDT is key to that idea as the majority of the campgrounds and dispersed campsites of the Rigdon Ranger District are within this Watershed. Most of the district's recreation use occurs here during spring, summer and fall. Activities include developed and dispersed camping, driving for pleasure, sightseeing, hiking, mountain biking, fishing and hunting.

Hills Creek Lake and the Middle Fork Willamette River provide a significant recreation area for water sports in the MFWDT. Sports such as water-skiing, sailboarding, kayaking, canoeing, and late winter fishing are very popular.

The reach of the Middle Fork Willamette River from Sand Prairie Campground to Echo Creek was determined to be eligible as a recreation river for inclusion into the National Wild and Scenic River System. The Outstandingly Remarkable Values are recreation, geologic and hydrologic, and wildlife resources.

Diamond Drive is a back country drive that begins on Highway 58 and continues on FS Road 21 in the northern portion of the Watershed. The drive highlights the scenic value of this area. Plans are to nominate it for inclusion into the State of Oregon's Scenic Drive system.



Chapter 2

Issues and Key Questions

Middle Fork Willamette River Downstream Tributaries Watershed

This chapter discusses the issues of concern for this Watershed. It also identifies the key questions used by the Watershed Team to assist in the analysis.

ISSUES AND KEY QUESTIONS

Initial development of the issue statements and key questions was in conjunction with the North Fork Watershed Analysis Team on February 9, 1995. Several iterations of these original thoughts have refined the issues. The issues and questions are coded to facilitate reference to them throughout the document. An alphabetical coding is used to identify the issue. The questions are listed by the alphabetical coding and then a number.

ISSUE VM Intensity And Pattern Of Vegetation Manipulation

Intensity and pattern of vegetation manipulation activities have altered the landscape processes. Timber harvest and the associated reforestation activities have played a significant role in shaping the vegetation patterns within this Watershed. Precommercial thinning and vegetation manipulation activities for resource enhancement projects have also altered the landscape. The resulting landscape pattern may be outside the range of natural variability. The intensity of these activities has exceeded the natural level of disturbance.

Fragmentation of the interior habitat has affected the composition of plant and animal species within the MFWDT Watershed. Fragmentation of late-successional forests and isolation or removal of riparian forests, affects the dispersal of organisms across the landscape by reducing habitat connectivity.

Early management activity has simplified the forest structure inside and outside riparian reserves, within the floodplain and the stream channels. Salvage done throughout the Watershed, left few snags for structure and future large woody material available for nutrient recycling.

The intensity of harvest activities has had a range of effects on processes within the MFWDT. The amount of vegetation disturbance has affected surface erosion and mass movement rates, altered timing and duration of peak flows, decreased water quality, and has altered floodplain and stream channel conditions, processes, and aquatic habitat.

KEY QUESTIONS

- **VM1** Compared to natural conditions, where have the intensity and pattern of vegetation manipulation affected plant and animal habitat diversity, species composition, amount of interior habitat, and habitat connectivity?
- **VM2** Compared to natural conditions, where have the intensity and pattern of vegetation manipulation affected ecological site productivity?

- **VM3** Where and to what extent have the changes in spatial and temporal distribution of vegetation influenced water yield, and peak flow? Where have these changes in hydrology affected channel function and habitat condition?
- **VM4** What are the most important delivery mechanisms for sediment generated by vegetative disturbances in this Watershed? What are relative rates of delivery by land form or slope to stream? Where are the high risk areas for generating, delivering or depositing sediment?
- **VM5** Where and to what extent has vegetation manipulation affected riparian and aquatic habitat complexity?
- **VM6** Given current Forest Plan direction, where and how many acres are available for vegetation manipulation?

ISSUE NF Exclusion Of Natural Fire

Modern day fire suppression has effectively reduced wildfire as a major factor in shaping the vegetation landscape patterns and processes. This reduction has resulted in increased fuel loadings and has altered the diversity of the forest structure. Suppression may have altered the habitat or abundance of Threatened, Endangered or Sensitive species or fire dependent species.

Increased fuel loadings may be of special concern within the Late-Successional Reserve (LSR) where there may be less opportunity for vegetation management activities to modify fuel accumulations.

KEY QUESTIONS

- **NF1** What is the comparison of the fire pattern, fire behavior and burn intensity between the current fuel loading conditions and the conditions before modern day fire suppression activities?
- **NF2** How has habitat diversity changed with modern day fire suppression?
- **NF3** How have fire pattern and behavior affected Threatened, Endangered and Sensitive species, and fire dependent species?

ISSUE TR Transportation System

Roads

This Watershed has an extensive transportation system. Some of the roads in the MFWDT are past their designed service life and are in varying stages of deterioration. These roads were designed for periodic maintenance using forest management activity receipts.

The Forest Plan requires that existing culverts, bridges, and other stream crossing structures posing a substantial risk to riparian conditions are to be improved to accommodate at least a 100-year flood event. The May, 1995 Culvert Assessment Survey indicate many stream crossing structures in this Watershed do not meet the 100 year flood standard.

Roads affect habitats for both plants and animals. Road traffic can be a disturbance mechanism for wildlife sensitive to noise or human presence. Roads also provide a transport mechanism for non-native plants.

Trails

The location and use of trails may be a factor in contributing sediment into the stream system.

Access

The transportation system in this Watershed allows extensive administrative and recreation access. Altering the system changes traffic patterns, recreational and administrative uses. Local economies, depending upon accessibility to large amounts of land, can be affected.

KEY QUESTIONS

Roads

- **TR1** Where and to what extent have the density and condition of roads influenced natural and management induced disturbances?
- **TR2** What sections of roads are currently introducing or have the potential to introduce excessive amounts of sediment into the stream system? Where and to what extent does the influx of sediment influence channel conditions?
- **TR3** Where and to what extent have the density and configuration of roads affected surface and subsurface hydrology.

- **TR4** Where are high risk or high priority stream crossings that do not have drainage structures designed to withstand 100 year events?
- **TR5** What are the possible resource effects of maintaining system roads at expected funding levels?
- **TR6** Where and to what extent have roads affected fish passage and riparian reserves?
- **TR7** Where and to what extent are the road locations and their use affecting wildlife and botanical species and special habitats

Trails

- **TR8** Where and to what extent has the condition and use of trails altered earth movement disturbances?

Access

- **TR9** How and to what extent does changed travel access influence potential human caused fire ignitions and suppression response time?
- **TR10** How does changed travel access effect public and administrative use of the forest and local economics?

ISSUE NS Introduction And Spread Of Non-Native Species

Introduction of a number of non-native plant and animal species occurred during the period of European occupation. These introduced species may be successfully competing against the native plants and animals. Disturbance from human activities allow these non-native species to persist.

The Forest Plan emphasizes management of native plants and animal species over non-native species. Introduction of non-native species was either accidental or on purpose for a variety of reasons. Some introduced species are deliberately chosen for resource management activities such as big game forage and stabilization of cutbanks. The extensive road system in the Watershed allows for continued dispersal and colonization. The Oregon State Department of Agriculture has classified some of these plants as noxious weeds. Some non-native plants are not noxious weeds but spread easily with frequent ground disturbing activities and may impact native species.

There is particular concern when the existence and spread of these non-native plants and animals have the potential to affect the viability of Threatened, Endangered or Sensitive species. Some wildlife species of concern are western pond turtles, native amphibians, and Northern spotted owls.

KEY QUESTIONS

- **NS1** Where and to what extent has introduction of non-native species affected native flora and fauna?

ISSUE EI Infrastructure

A number of administrative, community oriented, and industrial infrastructure facilities occur within the MFWDT Watershed. These facilities include a portion of the city of Oakridge, power lines, road rights-of-way, a railroad, four developed campgrounds, two day use recreation sites, numerous dispersed recreation sites a sewage treatment plant, one fire lookout, various helispots, and water sources used for administrative activities. These facilities may or may not have effects on the resource values of this Watershed.

KEY QUESTIONS

- **EI1** Where are existing and potential infrastructure land uses?
- **EI2** Does the presence and use of these facilities affect the Watershed resources?

ISSUE HL

Hills Creek Dam and Lake

Hills Creek Dam is one of 13 projects constructed for the purpose of controlling Willamette Valley flooding. During the rainy season from November through early February, a maximum of flood control storage space is provided.

There are several processes associated with the filling of Hills Creek Lake that changed the MFWDT. They include: 1) Changing the terrestrial and aquatic riparian habitat quality from a floodplain riparian complex to an upland riparian complex; 2) Changing aquatic species composition with the introduction of exotic fish; and 3) Blocking migration passage for Spring Chinook and bull trout.

The lake system established new processes. These include: 1) Lake turbidity from a fluctuating drawdown zone; 2) A change in downstream stream habitat complexity, and 3) recreation uses.

KEY QUESTIONS

- **HL1** How has the change from a river system to a lake (reservoir) system affected the aquatic ecosystem? What are the fish and wildlife species that have blocked or disrupted migration patterns?
- **HL2** How has the species composition changed with the filling of the lake? What are management opportunities?
- **HL3** What is the affect of the lake drawdown on lake turbidity? What are the restoration opportunities?
- **HL4** How has the channel downstream of the dam been altered since the construction of the dam? How has this alteration affected the aquatic ecosystem?
- **HL5** To what extent has the dam modified the average flows during all times of the year, and the average annual peak flows? How have these modified flows affected flood plain processes, functions, and their associated riparian area habitat?
- **HL6** How has the dam affected the sediment distribution and transport capability of the channel downstream of the dam?
- **HL7** How has the cooler water released from the dam in the spring and early summer affected aquatic species? How has the warmer water released from the dam in the late summer and early fall affected aquatic species?

- **HL8** What recreation opportunities are provided by Hills Creek Lake? How can these opportunities be enhanced? What is the affect on local economy?

Issues Identified But Not Analyzed

The following two issues were originally identified for the Middle Fork Willamette Downstream Tributaries Watershed Analysis but were not carried forward.

- **Need to restore and maintain habitat for future reintroduction of Spring Chinook salmon and bull trout.** This is a concern within the Watershed but is addressed under the vegetation and Hills Creek Dam issues. The results of this analysis will help us meet the objectives of the Aquatic Conservation Strategy Plan.
- **Demand for specialty forest products.** Demand for these products has recently increased and may continue to increase in the future with the potential of causing resource impacts. This is a management issue covered with Amendment No. 23 to the Forest Plan (USFS,1993) and the Special Forest Products Environmental Assessment (USFS,1993). The issue is not a key issue.