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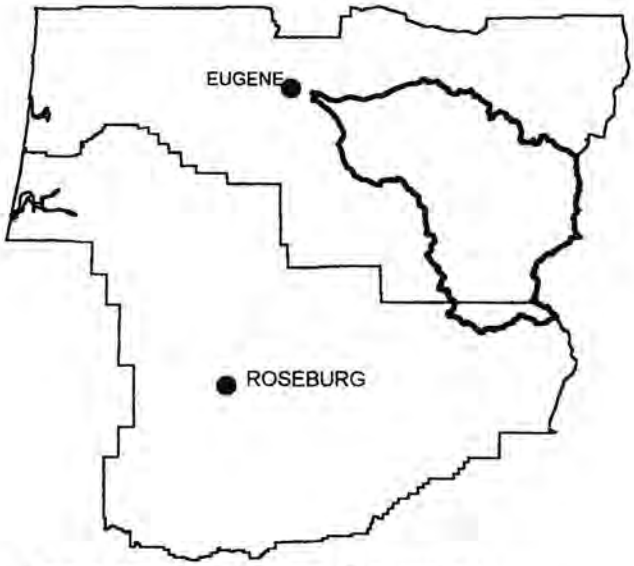
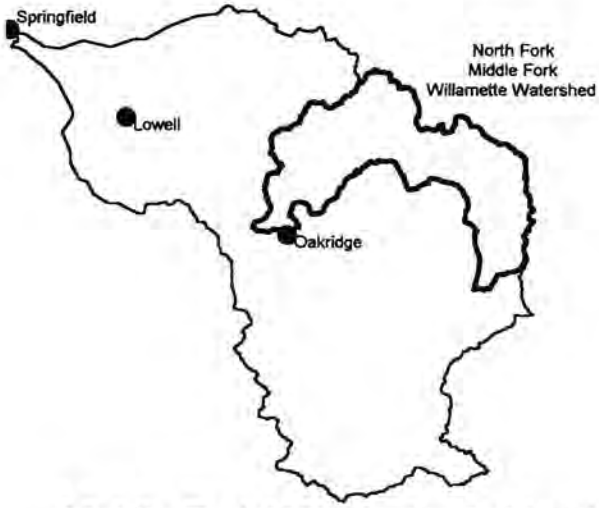
Oregon



Lane and Douglas Counties



Middle Fork Willamette Subbasin

INTRODUCTION

Location

The North Fork of the Middle Fork (NFMF) of the Willamette River contains two fifth field watersheds (Lower NFMF, 17 and Upper NFMF, 24), henceforth referred to as the North Fork, has a total watershed area of over 158,000 acres. It is one of the larger headwater drainage's of the Willamette River that drains the Willamette valley and, through a number of tributaries similar in size to the North Fork, a majority of the west side of the Oregon Cascade mountains. The watershed is located entirely within the Oakridge Ranger District of the Willamette National Forest immediately upstream of the City of Westfir, immediately north and northeast of the City of Oakridge, and begins about 40 air miles east southeast (or about 50 river miles upstream) from the Eugene/Springfield metropolitan area. Approximately 3700 contiguous acres (two percent of the watershed) is privately held, most of which is used for agricultural or forestry purposes, though the watershed also contains the City of Westfir and numerous rural residences.

Management Direction

The North Fork was designated as a Tier 2 Key watershed by the Final Supplemental Environmental Impact Statement (SEIS) on Management of Habitat for Late-Successional and Old-Growth Forest Related Species Within the Range of the Northern Spotted Owl (USDA, USDI, et. al. 1994b). This Key Watershed designation recognizes the high water quality and potential anadromous fish habitat provided by the North Fork. This SEIS has become popularly known as the Northwest Forest Plan, and has resulted in the amendment of the Willamette National Forest Land and Resource Management Plan (USDA Forest Service, 1990).

The Northwest Forest Plan Record of Decision requires that a watershed analysis be accomplished prior to any land management activity within Key Watersheds. This analysis has been done to comply with his direction and in a larger sense to provide decision-makers with a more comprehensive body of information upon which to base their land management decisions.

Document Format

This analysis tells a story of how this watershed came to have the characteristics it has, of the particularly important processes occurring within it, and how management activities have affected landscape processes and patterns in the watershed. As displayed in the Table of Contents, this story is comprised of the following components:

- A Characterization chapter that described the unique or particularly important characteristics of the watershed.

- An Issues and Key Questions chapter describing the various concerns and opportunities that exist in the management environment and identifying the questions that need to be answered to better make the many decisions that need to be made now and in the future.

- A Reference Conditions / Current Conditions chapter discussing the historical conditions of the watershed and how those conditions have changed over time in order to put into perspective the current condition existing in the watershed; presented in relation to the various relevant resources.

- An Interpretation chapter that explains the differences between historical, current and natural conditions and how those factors affect the watershed's capacity to achieve management objectives, presented in relation to Issues and Key Questions. This chapter provides answers to the Key Questions.

- And a Recommendations chapter that identifies those management activities that could move the system towards reference conditions or management objectives.

This format is based on that presented in "Ecosystem Analysis at the Watershed Scale, Review Draft" (USDA, USDI, 1995). The presentation of this analysis is essentially linear; one page follows another. The processes and features of this watershed are complex, interact with one-another, and can be generally conceived of as a multi-dimensional entity. Telling the story of such a complex phenomenon as a watershed in a linear format invariably will result in a substantial amount of overlap and/or generalization. For example, water quality can be influenced by a number of very different activities, processes, and underlying structures. While water quality can be considered a physical condition (as opposed to biological), biological processes may have profound influences on the quality of water. We beg the readers' indulgence for the unavoidable repetition of some key concepts and conditions as we attempt to illustrate the three-dimensional nature of this watershed and the complex processes occurring within it.

CHARACTERIZATION

CHAPTER I

CHARACTERIZATION

This section describes the dominant physical, biological, and human dimension characteristics of the watershed that are useful in understanding how the processes occurring within the watershed affect its conditions and functions.

Physical

This watershed covers some 158,200 acres which range in elevation from 1000 feet above sea level at the North Fork/Middle Fork confluence to the 7362 foot summit of the Twins on the crest of the Cascade mountains on the eastern edge of the watershed. Approximately one half of the area is above 4000 feet in elevation, though the highest number of acres in any 500 foot elevation range (15 percent of the watershed) is centered on the 5500 foot contour.

The climate in this area is typical of the greater west slope Cascade Mountain ecosystem; a Mediterranean climate with a wet winter, spring, and early summer and usually a quite warm and dry summer and fall. Precipitation ranges from 45 to 80 inches per year, with the highest amounts occurring in the northeastern portion of the watershed (Legard and Meyer, 1973). Above 5000 feet in elevation most of this precipitation falls as snow and accumulations can exceed 10 feet in depth. This large amount of precipitation has, in conjunction with the underlying geology as discussed in the following section, created the diverse topography found in this watershed through stream erosion and glacial action.

The North Fork river is free flowing for its entire length with the exception of a small impoundment, several hundred yards upstream from the City of Westfir, which was once used as the City's water intake diversion. This impoundment does not affect sediment routing or fish passage, though it is a significant hazard to raft and kayak use. An old mill pond dam did restrict fish passage about 2 miles upstream from the confluence of the North Fork and the Middle Fork of the Willamette River. This dam was removed in the summer of 1994 in a joint effort between Lane County and the Oregon Department of Fish and Wildlife as one of the first steps in readying the North Fork for the reintroduction of anadromous fish. Anadromous fish passage into the North Fork is now blocked only by the Dexter and Lookout Point dams near Lowell, Oregon, about 18 river miles downstream from the North Fork/Middle Fork confluence.

GEOLOGIC HISTORY

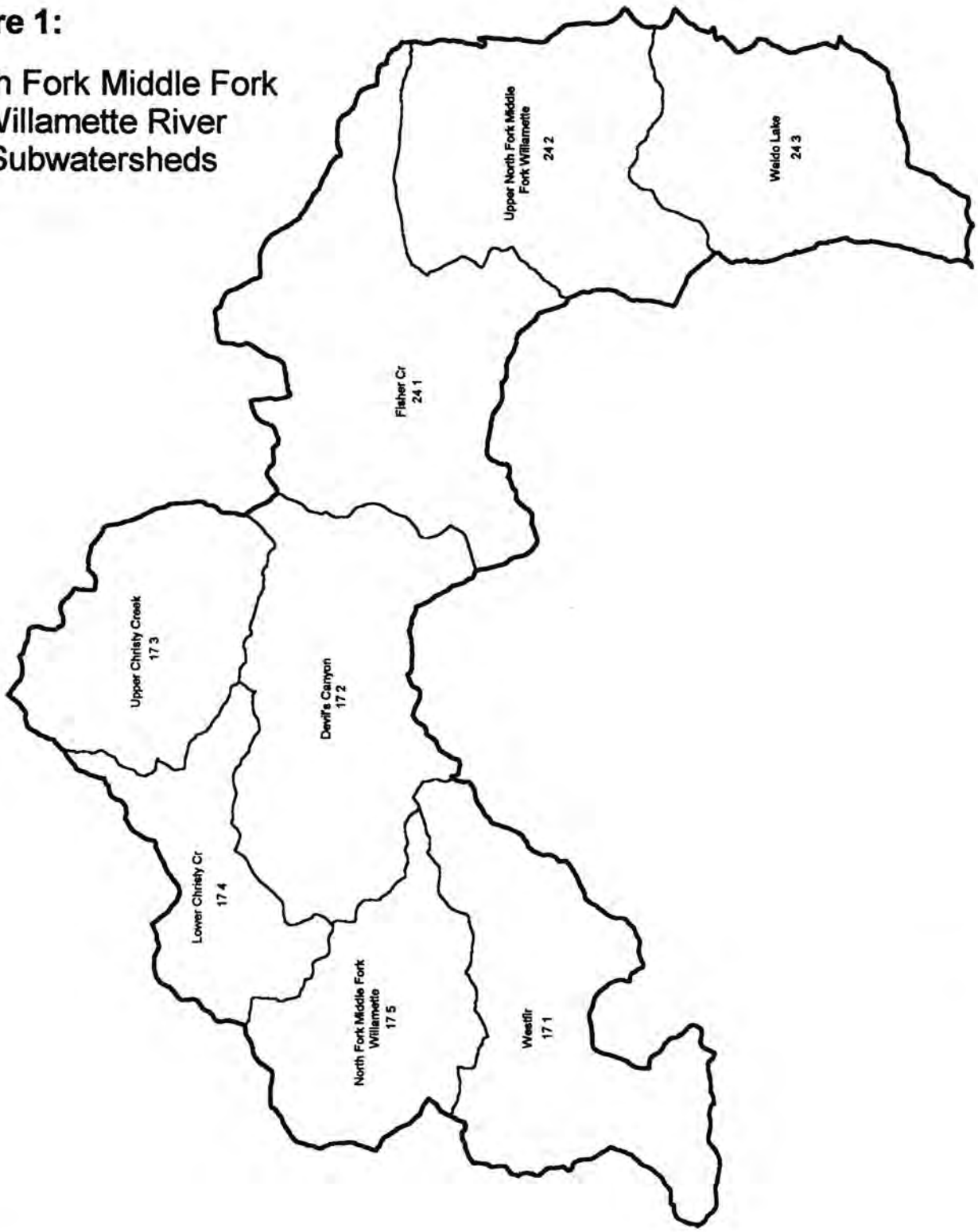
The following is a brief discussion of the geologic features and process that occur within the North Fork drainage and that most directly relate to the current landscape. Additional information regarding the geology of the area is found in the North Fork Wild and Scenic River Plan (USDA, Forest Service, 1992).

The North Fork basin consists of three distinct geomorphic subdivisions: The Waldo Basin, the Upper Valley and the Lower Valley. These three areas differ in lithologic age, dominant landforming processes and current landscape character.

As described here, the Waldo Basin includes Subwatershed 24-2 exclusive of the northwest corner and all of 24-3 (see Figure 1 of this chapter). This area is characterized by recent glaciation and volcanism, fairly gentle ground, and an abundance of alpine lakes. Soils are derived from recent glacial till overlain by the relatively new mantel of air fall pumice from the eruption of Mt. Mazama (Crater Lake) some 7700 years ago. They tend to be porous and erosive on steeper slopes. Waldo Lake is the dominant feature within the basin and contains some of the purest water in North America.

Figure 1:

North Fork Middle Fork Willamette River Subwatersheds



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The Upper Valley section runs from the headwaters of the North Fork and Fisher Creek to roughly Devil's Canyon Creek and includes Subwatersheds 24-1, the northwest corner of 24-2 and the east half of 17-2. From a geologic point of view, the area between Devils Canyon Creek and Christy Creek (the west half of 17-2) is transitional between the Upper Valley and the Lower Valley geomorphology. The Upper Valley is characterized by the results of alpine glaciation; i.e. U-shaped valleys, steep channel sidewalls, thin and rocky soils on the sideslopes, and glacial till and alluvium filling the lower sideslopes and valley bottoms.

The Lower Valley includes Subwatersheds 17-1, 17-3, 17-4, 17-5 and the west half of 17-2 and runs from Devil's Canyon Creek to the confluence with the Middle Fork Willamette. This area consists of older, pyroclastic material and extrusive lava flows. Soils formed from this material tend to have a higher clay content, are often quite deep and the landscape is much more dissected than the Waldo Basin or Upper Valley areas. This area contains a suite of soil types that can be unstable, especially that area west of the North Fork in the lower valley. The North Fork is a valley confined channel throughout this portion.

Two unique features are located near the transition from the Upper Valley and the Lower Valley. The first is the occurrence of several large earthflows, most notably within Tumble Creek drainage (currently stable) and Chalk Creek drainage (currently unstable). The second unique feature within this transition zone is the influence of the North Fork Intracanyon Lava Flow. This flat topped, steep sided flow is one of the largest in the region and was deposited within the ancestral North Fork channel. This plain, which is about 5 million years old, can be traced from the vicinity of Lowell Creek to near the City of Westfir. Influences on the landscape include channel confinement of the North Fork, seeps near the basal contact (between First and Huckleberry Creeks), permeable localized hydraulic conduits (Camp-5 Slide), periodic damming and diversion of the North Fork as a result of slope collapse and a large relatively flat area of productive soils.

HYDROLOGIC FEATURES

One of the most prominent features of the North Fork watershed is Waldo Lake with a surface area of 6,298 acres. The surface elevation of Waldo Lake is 5,414 feet and it is one of the largest natural lakes in Oregon. The maximum depth of Waldo Lake is 420 feet. This depth of water is second only to Crater Lake within Oregon. Waldo Lake has a relatively small drainage area with water replenishment by rain, snowmelt run-off, and subsurface flow. There are no permanently flowing inlet streams. However, a number of intermittent streams flow into the lake during the snowmelt season. Due to its relatively small drainage size, it takes approximately 30 years to completely replace the water volume in Waldo Lake (Johnson et al. 1985).

The outlet of Waldo Lake is the headwaters of the North Fork. From Waldo Lake downstream, flow in the North Fork gradually increases due to numerous tributaries and underground sources. The largest tributary is Christy Creek and enters the North Fork at approximately river mile 14.6. The river drops 4,400 feet over its 42.3 mile length. The steepest gradient in the river channel is found in the first 6 miles where the river drops 2,400 feet in elevation. Currently, the only filed water right for the North Fork is for 1.00 cfs for the City of Westfir.

CHANNEL CHARACTERISTICS

The North Fork has considerable variation in its channel features from its source to the confluence with the Middle Fork of the Willamette. Depositional areas, occurring where the gradient is low, typically are less constrained by the valley walls, and have a greater degree of sinuosity (e.g. Cedar bog located in the upper watershed and the reach between Fisher Creek and Camp Five). The lower and upper reaches are narrowly constrained by the valley walls, have a high gradient with low sinuosity, and are largely influenced by geologic features (e.g. "The Gorge" located in the lower watershed). Channel complexity has been reduced from historic levels due to a combination of

management activities (primarily riparian harvest and salvage of in stream logs) and natural events (primarily large flood events).

AQUATIC HABITAT

Stream survey reports indicate that prior to 1930 the North Fork had some of the best habitat for anadromous fish within the Middle Fork of the Willamette basin. Habitat complexity in streams and localized stream bank stability has been reduced below natural levels due to removal of in-channel large woody material. In the upper portion of the North Fork and in many tributaries, waterfalls create upstream migration barriers for fish. In addition to these natural barriers, numerous road/stream crossing culverts were installed in a manner that creates additional barriers to the upstream migration of fish and has resulted in isolated resident populations of fish in some streams.

Significant diversity exists in the numerous lakes and ponds that are for the most part located in or adjacent to wilderness areas. The majority of the lakes within the watershed can be categorized as having a trophic status of oligotrophic or ultraoligotrophic. These classifications mean the lakes have low to very low concentrations of nutrients in the water and low organic production.

POTENTIAL CHANGES IN PEAK STREAM FLOWS

Some drainage's that are tributary to the North Fork River have a high proportion of their area located in what is defined as the transient snow zone (especially the lower North Fork, watershed 17). The vegetative condition within portions of the transient snow zone have been substantially altered by stand replacement timber harvest. This condition combined with an extensive road network may have caused higher peak stream flows and associated adverse effects on water quality and stream channel conditions in some drainage's.

WATER QUALITY

The Oregon Department of Environmental Quality (DEQ) has identified beneficial uses for Willamette River tributaries (OAR 340-41-442). Relevant beneficial uses include; public domestic water supply, resident fish and aquatic life, fishing, boating, water contact recreation and aesthetic quality. The Oregon DEQ also has indicated that the North Fork has a moderate (with data) problem rating for water quality conditions, water quality conditions affecting fish, and stream quality conditions affecting aquatic habitat. These problems are primarily due to elevated stream temperatures and the presence of suspended sediment during high flows. The North Fork has no water quality problems associated with water contact recreation or drinking water supplies (ODEQ, 1988).

Tier Two Key Watersheds, such as the North Fork, were identified in the Northwest Forest Plan as important sources of high quality water. The North Fork Wild and Scenic River Plan (USDA Forest Service 1992) identifies water quality as an outstandingly remarkable value. Direction specific to Wild and Scenic Rivers found in 40 CFR 131.12(3) states "where high quality waters constitute an Outstanding National resource, such as waters of National and State Parks, and wildlife refuges and waters of exceptional recreation or ecological significance, that water quality shall be maintained and protected." The antidegradation policy component of the water quality standards requires that the Agency consider water quality impacts in management and activity planning and that no degradation of Wild and Scenic River water quality may occur which will interfere or be injurious to the beneficial uses of the water. Water quality in terms of temperature and turbidity occasionally exceed existing guidelines as further discussed in the Reference/Current Conditions chapter.

SOURCES OF POLLUTION

The primary sources of water pollution along the length of the North Fork River are considered nonpoint sources. These pollutants originate from diffuse sources rather than a discharge at a single

location. The primary nonpoint source problems of concern include elevated levels of sediment and increased stream temperatures. Elevated levels of sediment are often associated with soil erosion from road surfaces and hill slopes where vegetation has been disturbed. Elevated stream temperatures can often be attributed to reduced amounts of streamside vegetation, generally from past harvesting prior to establishment of policies requiring retention of riparian vegetation.

WALDO LAKE

High water quality has been recognized as one of the most outstanding attributes of Waldo Lake. The level of purity of the lake water has been compared to that of distilled water. Waldo Lake is regarded by some experts as one of the purest lakes in the world. Due to the low concentrations of nutrients found in ultraoligatrophic lakes such as Waldo, they are considered highly sensitive to adverse effects from nutrient inputs as a relatively small amounts may represent a large percentage increase. The Oregon DEQ has found that Waldo Lake should be designated as an Outstanding Resource Water (ODEQ,1994b). The only other body of water recommended for this designation is Crater Lake.

LAND MANAGEMENT

As further discussed in the following Management History section, this watershed has produced a substantial amount of timber volume over the past seven decades. To date approximately 50,000 acres (32 percent of the watershed) have been regeneration harvested and about 2400 acres have been commercially thinned. This amount of harvest has required the construction of approximately 570 miles of road. Some 57 miles of this road system are paved (including the roads in four of the five developed campgrounds), most of the rest are single lane gravel with turnouts. Most of the system roads in this watershed are crowned with ditches and cross-drain culverts to disperse precipitation falling on the road surface or subsurface flow intercepted by the road cut.

Biological

VEGETATION

Plant communities in the watershed are very diverse and reflect landscape influences, varied soils and landforms, and the wide elevational gradient. Most of the plant associations described by Hemstrom et al. (1987) are represented within this watershed. The North Fork of the Middle Fork of the Willamette Wild and Scenic River Corridor Environmental Analysis and River Management Plan (USDA, 1992) describes the extensive environmental gradient and vegetational diversity found in the corridor as an outstandingly remarkable value.

Approximately 90 percent of the watershed is occupied by coniferous forests ranging in age from several to over 600 years. Other plant community types that are found within the watershed include: herbaceous wetlands (bogs, marshes, meadows dominated by sedges, rushes, grasses); hardwood and shrubby wetlands (hardwood marshes and swamps), coniferous wetlands (cottonwood and western red cedar swamps), red alder forested acres (wet and dry types), coniferous-hardwood forests, temperate and high temperate coniferous forests (with lodgepole pine), subalpine forest parks, rock outcrops, talus and talus/shrub communities, Oregon white oak woodland inclusions, and grass and forb dry hillsides. None of these communities are unique to the province except as mentioned in the following remnant population's section.

The harvesting which has occurred over the last seven decades has created most of the younger age classes but wildfire has had the largest influence of any natural process upon the structure and distribution of vegetation age classes within this watershed.

This harvest period mentioned above was not spread evenly over the watershed. The first 16,000

acres harvested was more or less contiguous. Harvest after the 1940's was more or less evenly dispersed across the lower two thirds of the area. Very little harvest has occurred in the upper one third of the watershed; those areas now occupied by the Waldo Wilderness, the Waldo Lake Recreation Area, and the Chucksney Mountain Roadless Recreation Area. If the amount of past harvest is applied only to the areas outside of the three above unharvested areas, about 50 percent of the land available for timber harvest has already been harvested.

REMNANT POPULATIONS

Though the non-forested areas represent a small portion of this watershed, these areas provide habitat for some relatively uncommon plant communities. One shrub dominated wetland, along the river near the center of the watershed, contains a population of quaking aspen. Aspen is a species not often found on the west slope of the Cascades. Some south-facing rock outcrops also support populations of rabbit brush, another shrub that typically grows only on the east side of the Cascades. Some of the rocky meadow on south facing slopes also contain stands of Oregon white oak. White oak is typically found at lower elevations and is quite abundant in the Willamette valley.

Alaska yellow cedar and sub-alpine fir, trees more typically found at much higher latitudes, can occasionally be found on high ridges and north-facing cirque basins. Whitebark pine, typically a sub-alpine and alpine tree, also occurs in limited areas within the watershed, generally on the two percent above 6500 feet in elevation.

FIRE HISTORY

Aside from the general climate that provides for the forest growth in this watershed, wildfire is the most dominant force shaping the structure and age class distribution of the forest. Over the past two centuries, about 62,000 acres have been subject to stand replacing (or catastrophic) wildfire. Some of these areas have even burned twice in this period. As shown by Figure 2 of this chapter, the wildfire occurrence has not been uniform over the watershed. About 58 percent of the upper North Fork (watershed 24) has experienced catastrophic fire in the last 200 years. About 27 percent of the lower North Fork (watershed 17) has burned during the same period. Average tree ages in undisturbed areas of the lower North Fork indicate that this area probably experiences very large fires that may effect most of the watershed at intervals in excess of 400 years. Approximately 13 percent of the acreage affected by fire over the last 200 years retain small to moderate numbers of trees which survived the last fires.

Stand replacement fire has occurred in almost every decade in the last 200 years. In terms of large acreages burned, the fire return interval (time between large fires) for this watershed is approximately 60 years over the last 200.

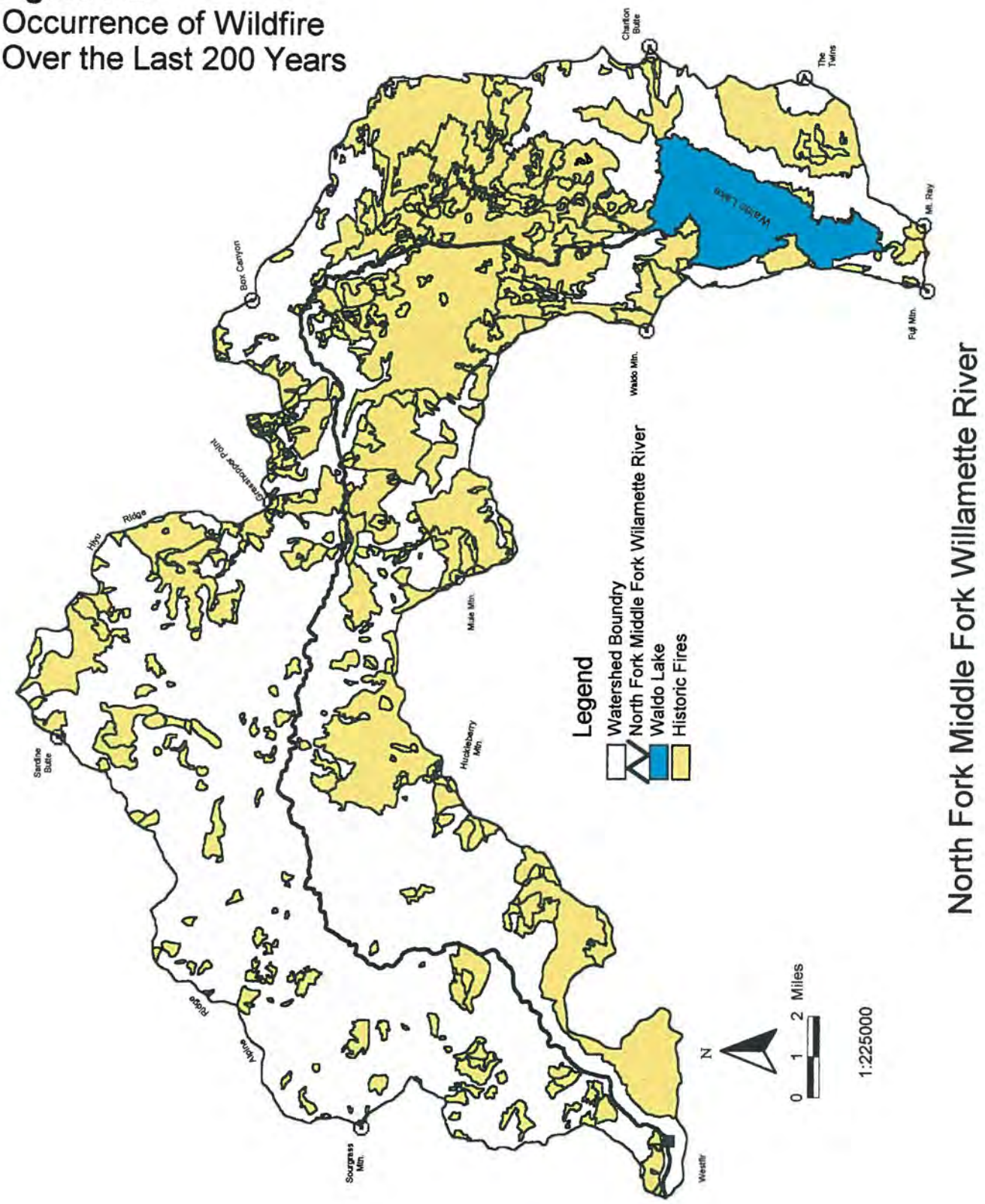
An undetermined number of acres that underburned with low amounts of overstory tree mortality are not included in these wildfire acreage's. Several areas in the watershed have indications of reburning and its profound effects on the structure of the subsequent stands. The large fire that burned around 1900 in the Fisher Creek drainage and around the Erma Bell Lakes north of Waldo Lake, and the fire that burned around 1845 in the Devils Canyon Creek drainage, are examples of such areas. It appears that these areas of underburning were extensive and possibly more frequent than stand replacing fire.

WILDLIFE HABITAT AND SPECIES

GENERAL TERRESTRIAL

The range of elevation, aspect, slope and soil types described previously contribute to the wide range of diversity of wildlife habitat types within this watershed. As described in the Vegetation section, timber

Figure : 2
Occurrence of Wildfire
Over the Last 200 Years



North Fork Middle Fork Willamette River

harvest and wildfire have contributed greatly to the diversity of stand conditions and stand ages present within the watershed.

Appendix A contains a list of species expected to occur within the watershed along with their guild identification. Many of the vertebrate species expected to occur on the Willamette National Forest (327 species of birds, mammals, reptiles and amphibians combined; USDA 1995b) are expected to occur within this watershed. The distribution of these species and their aggregation into communities vary with the distribution of plant communities, vegetational condition and climatic conditions across the landscape.

FISH

The North Fork Watershed contains a variety of aquatic species. Wild populations of cutthroat and rainbow trout exist throughout the watershed. Brook trout are present in the extreme upper portion of the North Fork and may also be present in tributaries that flow from many lakes in the upper reaches of the watershed that have been stocked with brook trout.

The North Fork historically supported runs of spring Chinook salmon and steelehead trout. The construction of the Westfir mill pond dam in the 1920's blocked upstream anadromous fish migration. A fish ladder was included in its construction but it was ineffective. Migration was further blocked in the 1950's with the construction of Lookout and Dexter dams. Bull trout are believed to have inhabited the watershed but they are no longer thought to be present due to the introduction of predatory brook trout, lack of an anadromous fish prey base, and dam construction.

There is potential for the reintroduction of spring Chinook and steelehead into this watershed if a method can be developed to capture and transport migrating juveniles downstream where they could be released below the remaining dams. Due to the presence of brook trout (brook trout are known to hybridize and compete with bull trout) in the upper North Fork, there are not currently any plans to reintroduce bull trout to the watershed.

The North Fork watershed contains hundreds of lakes, located primarily in wilderness areas. Many lakes have been stocked with brook trout, rainbow trout, and cutthrout trout. Many of these same lakes originally contained no fish. Little is known about the limnological and biological parameters of lakes within the watershed, with the exception of Waldo Lake.

The introduction of fish to naturally fishless lakes has affected amphibian, macroinvertebrate, and zooplanktom populations (Liss, 1991). These effects may be due to competition for food or due to the fact that these organisms are often prey for introduced fish species.

AMPHIBIANS

There are several sensitive amphibian species located in the North Fork watershed, including the tailed frog, the red-legged frog, and the Cascade frog.

MACROINVERTEBRATES

There is not much information available on the macroinvertebrate species occurring in this watershed. However, several sensitive species of aquatic insects are known to occur on the Willamette National Forest.

Social

There is close relationship between the resources contained in this watershed and use of those resources for employment and recreational opportunities. The area of private land within the watershed

includes the Oakridge public golf course and a community cemetery. The North Fork also is the source of municipal water for the City of Westfir, which has a population of 304.

MANAGEMENT HISTORY

NATIVE AMERICANS

The North Fork watershed has experienced use by humans for perhaps 10,000 years. Historic, archaeological and paleoclimatic research in the watershed suggests that people adapted to changing conditions and influenced the development of their environment.

At the time of European exploration at least three tribes are thought to have used the North Fork watershed. The Molala are believed to have had winter villages in the Oakridge/High Prairie area and, with the Kalapuya of the Willamette Valley, to have seasonally visited the higher elevations of the North Fork. In later times, possibly after the arrival of the horse, the Klamath made trips into the area on their way to the Willamette Valley to trade.

Over 50 archaeological sites representing seasonal base camps and more temporary campsites have been found in the North Fork watershed. The majority of these sites are located in lower elevation terraces associated with meadows and prairies which were much more extensive before Euro-American settlement. There is good evidence from Government Land Office survey plats, explorer's journals, tribal oral history, and stand ages adjacent to known prehistoric sites that fire was used as a tool to maintain a more open landscape. Both prairie fires and forest underburning were techniques used to hunt game and to ensure the return of various important plants.

THE HOMESTEAD ERA

The majority of early settlement in the Oakridge area was along the main stem of the Middle Fork Willamette river. Only one homestead was claimed on the North Fork in the 1890's, although nearby settlers grazed cattle and sheep in the area. Stewart P. Brock staked his claim in an open prairie area now known as Brock Meadow. Beginning in 1914, the Forest Service permitted grazing allotments in the North Fork watershed for cattle and sheep. Animals were trailed up the North Fork to allotments at Blair Lake, Major Prairie, Grasshopper and Chucksney Mountains, as well as up into the Taylor Burn area.

MINING

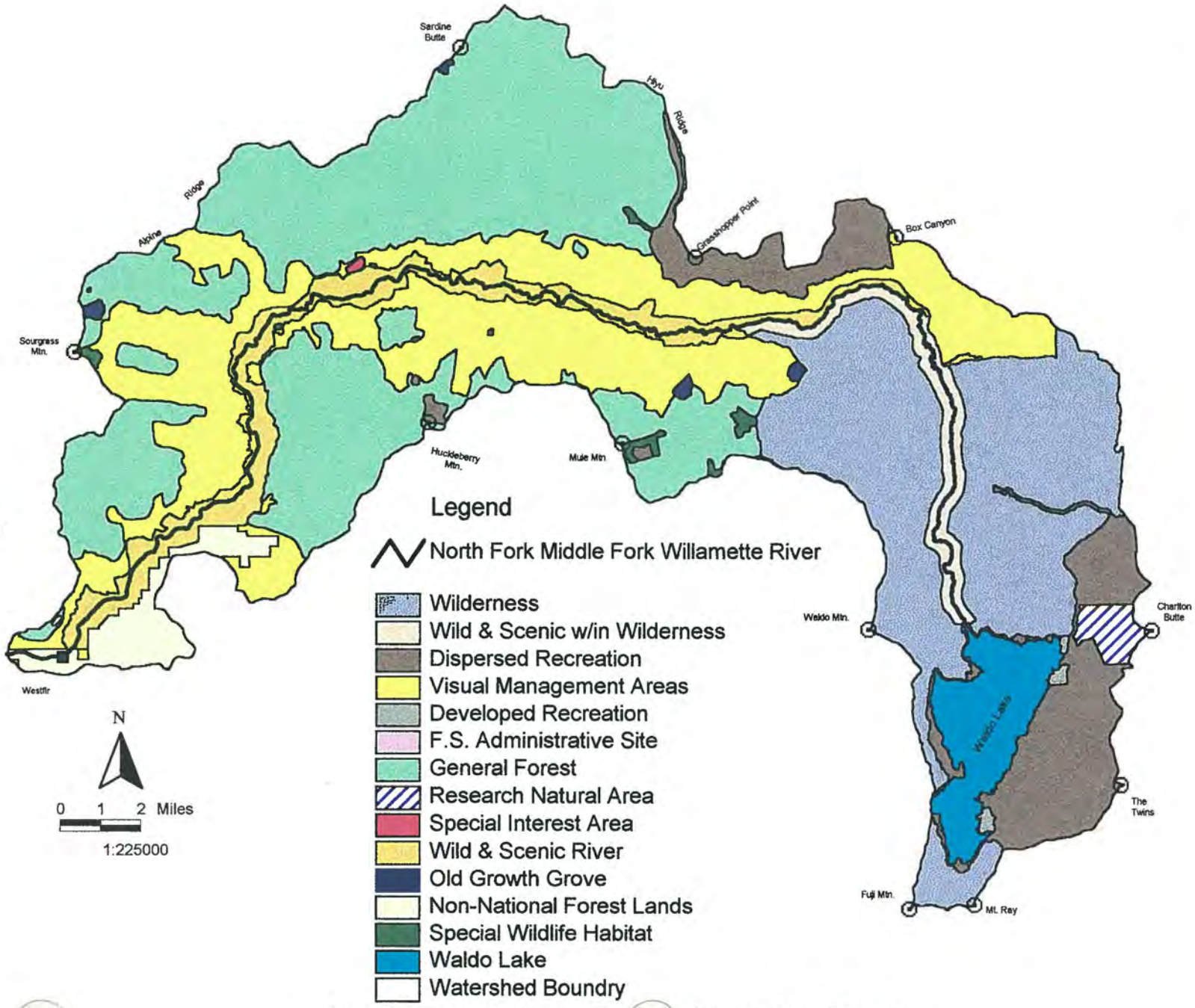
Gold was discovered in the Christy Creek area in 1881 and was actively mined in 1903. Known as the "Fall Creek Mining District," six claims were developed to some extent with trenches, pits, adits or tunnels. Active mining does not currently occur in the watershed, though several valid mining claims still exist.

FOREST MANAGEMENT

Logging within this watershed began in 1921-22. A dam was built across the North Fork in 1923 and the Westfir sawmill was built. No splash dam construction (often done to transport logs by water) is known to have taken place within the watershed. In January of 1923, the Forest Service proposed a timber sale to include 13,300 acres of the North Fork watershed, the largest sale of its kind to be sold in the Douglas-fir region. This sale resulted in the construction of a mill, town (Westfir), and logging railroad by 1925.

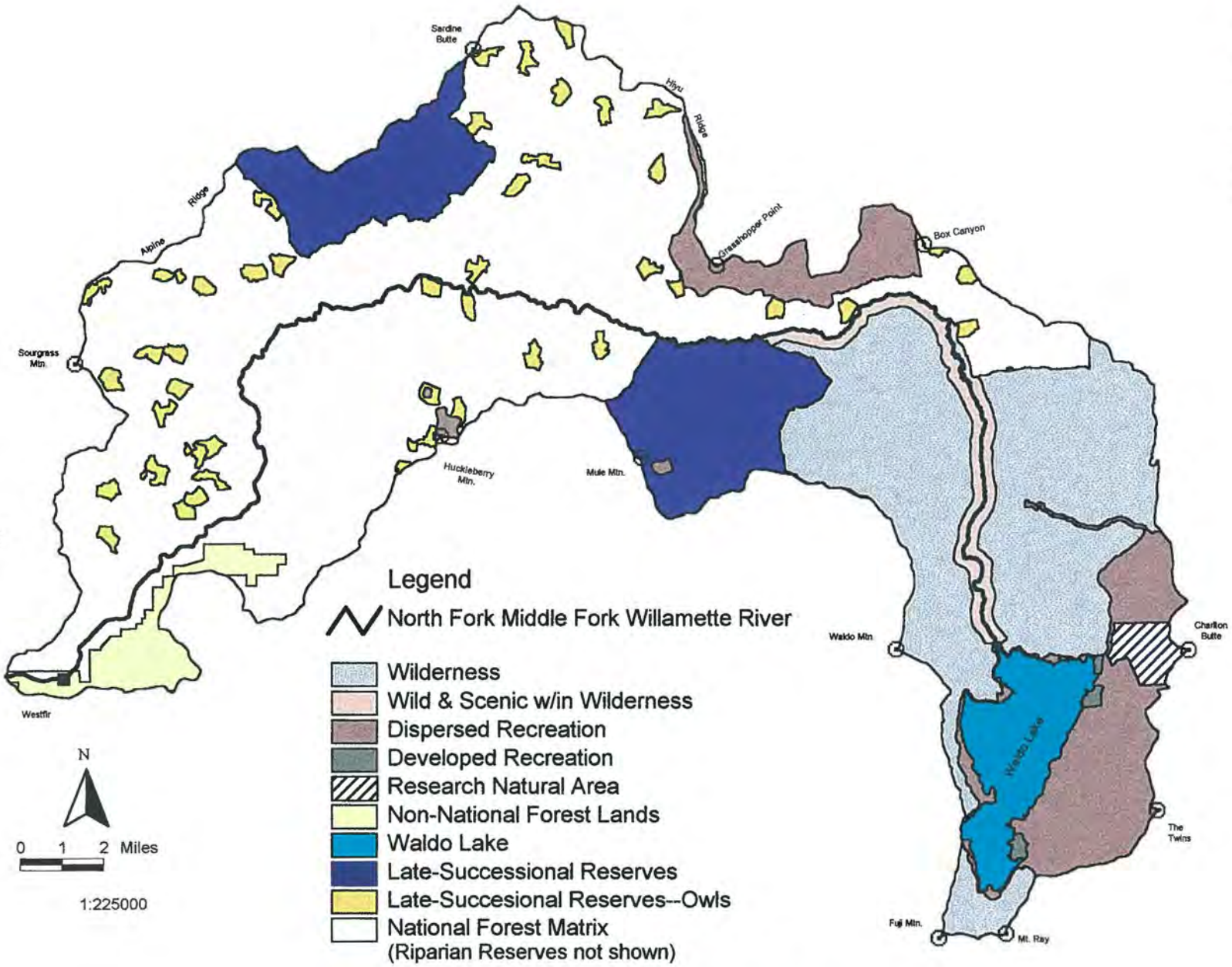
An average of 700 acres per year was harvested between 1925 and 1990. Most of this harvest has occurred in the lower North Fork. After about 1940, log hauling was done by truck, and an extensive road system was built to accommodate the harvest activities.

Figure: 3
1990 Willamette National Forest
Land and Resource Management
Plan Allocations



North Fork Middle Fo Willamette River

Figure: 4
Ownership Pattern and Forest Plan Allocations as Ammended



North Fork Middle Fork Willamette River

In 1979 the sawmill at Westfir burned. A plywood plant continued to operate through 1983 until it too burned. The Westfir mill site was abandoned at that point except for a few small sawmill operations that leased the site for short periods.

In the North Fork watershed, lookout sites or stations were established on Buckhead Mountain, Dead Mountain, Grasshopper Mountain, Huckleberry Mountain, Mule Mountain, Sardine Butte, and Waldo Mountain. The only remaining lookouts still being used for fire detection are the Huckleberry Mountain and Waldo Mountain structures.

A system of trails was constructed. Much of this system was constructed by the Civilian Conservation Corps from 1929 to 1942. The Civilian Conservation Core constructed campgrounds at Kiahanie, Skookum Creek, North Waldo Lake and Taylor Burn. They also built Forest road #1957 from Box Canyon to Skookum Creek.

The Box Canyon road, which crosses the river corridor near Brock Meadows, was built by the Forest Service in the early 1920's as an administrative access road. Some newer roads have replaced portions of the Box Canyon road but many sections remain in their original condition.

MANAGEMENT DIRECTION

The Willamette National Forest Land and Resource Management Plan (USDA, 1990) prescribes land uses by assigning various Management Area designations to land within the Forest. The North Fork watershed contains some 20 such management areas as shown in Table 1 below. (see also Figures 3 and 4 of this chapter).

Table 1: Willamette National Forest Land and Resource Management Plan Management Areas

Management Area	Description	Acres	Percentage
1	Wilderness	35,527	23
4	Research Natural Area	1,178	1
5	Special Interest Area	67	<1
6	Wild and Scenic River corridor	9,186	6
7	Old-Growth Grove	368	<1
9	Special Wildlife Habitat Area	632	<1
10c	Semi-Primitive Dispersed Recreation (Waldo Lake Road and Campgrounds)	2,970	2
10e	Semi-primitive Dispersed Recreation (Waldo Lake and Chucksney Mountain Roadless Recreation Areas)	12,250	8
11a	Scenic, Modification	1,740	1
11c	Scenic, Partial Retention	23,580	15
11d	Scenic, Partial Retention	1,928	1
11f	Scenic, Retention	133	<1
12a	Developed Recreation - campgrounds	179	<1
13	Administrative Use Area	21	<1
14	General Forest	38,065	25
WA	Waldo Lake	6,076	4
Riparian Reserves (1)			about 35
Late Successional Reserve		16,270	10
Supplemental Late Successional Reserves		5,114	3
		58,280	

(1): riparian reserves are included within the acreage of other management areas
* The above acreage's do not include the 3700 acres of private land within the watershed.

The following documents also provide specific management direction for portions of this watershed:

- Environmental Assessment and River Management Plan -- North Fork of the Middle Fork of the Willamette Wild and Scenic River
- Environmental Assessment -- Aufderheide Drive Transportation System and Management Project
- Late Successional Reserve RO220 Assessment

RECREATION

Wild and Scenic River

The North Fork was Congressionally designated a Wild, Scenic, and Recreational River for the outstandingly remarkable values of: water quality, scenic, recreation, geologic, hydrologic, vegetation, ecologic, prehistoric, historic, traditional use-cultural, fish, and wildlife. The Wild section of the river occurs entirely within the Wilderness, the Scenic section occurs where the river is adjacent to the wilderness boundary, and the recreational segment begins where the river leaves the adjacent wilderness boundary at Fisher Creek. See the North Fork Wild and Scenic River Management Plan (USDA 1992) for more information on the conditions, values, and management of this river corridor.

Scenic Resources

Aufderheide Scenic Byway (Forest Road 19) parallels the lower 30 miles of the river. The Byway is the center of a viewshed (designed for scenic, partial retention, MA 11c) in which timber harvest is scheduled so long as harvested areas remain visually subordinate to the characteristic landscape. The Byway is a double lane paved road that continues into the South Fork of the McKenzie River and the Blue River Ranger District, eventually connecting to State Highway 126.

Miscellaneous Attractions

The watershed contains one Special Interest Area (as designated by the Forest Plan) known as "Hell Hole". This area is a deep crack in the steep cliffs on the edge of Christy Flats. The watershed also contains several Forest Plan Old-Growth Groves (the Elk Camp Old-Growth Grove and the harder to access Cayuse Creek and Fisher Creek groves), the Constitution Grove (a stand of 225 year old trees along Aufderheide Drive), the Chucksney Mountain Roadless Recreation Area, the Charlton Butte Research Natural Area, and a number of Special Wildlife Habitat Areas generally centered on meadows or wetlands.

Waldo Lake

The area surrounding Waldo Lake that is not designated as wilderness is known as the Waldo Lake Recreation Area, and is allocated by the Forest Plan to semi-primitive, non-motorized dispersed recreation (MA 10c and 10e) except for the campgrounds and the road accessing them. The Waldo Lake basin offers a set of fairly unique recreation opportunities including boating in extremely pure and transparent water, expansive views over uncut forest lands, hiking, developed and dispersed camping, mountain biking, hunting, fishing, snowmobiling, cross-country skiing, etc. The area is sometimes heavily used on summer weekend holidays but the mosquitoes often keep many people away until after mid-August.

Boating

The lower nine miles of the North Fork attracts mainly kayak (and some raft) use. This portion of the river is considered by some to be one of the best white water runs within the Willamette River drainage (Willamette Kayak and Canoe Club, 1986) though some find the river too difficult to consider it "the best". The section above Camp Five is not as technical and is occasionally kayaked during high water levels. Its proximity to Eugene, and low use makes it attractive.

Waldo Lake's size attracts water craft from motor boats and sailboats to canoes. A debate as to whether motors should be allowed on the Lake, based at least partially on a perception that the use of internal combustion motors could be or is affecting the water quality, has been ongoing for the last ten years. This issue was one of the most mentioned issue in the public response to the 1989 draft Forest Plan. Boats are used to reach Rhododendron Island Campground and numerous dispersed campsites on the Lake's shoreline.

Swimming

In the summer, when the river warms up and the flow slows down, the pools of the lower North Fork are used extensively by swimmers. The beaches adjacent to the Waldo Lake campgrounds are also used in the late summer when the water is warmer and the mosquitoes fewer.

Dispersed Camping

Many dispersed camp sites exist along the North Fork and are well used in the summer because they offer seclusion, easy road access, and proximity to the river. Dispersed sites also exist on the shores of Waldo Lake. These sites are typically accessed by water.

The Three Sisters and Waldo Lake Wilderness areas provide numberless primitive campsites scattered among serene mountain lakes and meadows. The solitude, scenery and fresh mountain air enhance the primitive experience.

There are also a large number of lightly used dispersed camp sites scattered across the watershed. Many of these sites are on old logging landings. These sites are most often used during hunting season.

Fishing

The North Fork is locally known for its fly fishing opportunities. The river has been managed for the last 15 years as a quality fishing river by the Oregon Department of Fish and Wildlife. It is managed as a wild trout river; hatchery reared fish are not put into the river. Fishing is restricted to the use of fly rods and lines above the railroad trestle in Westfir. Recently the river has been opened to year-around fishing as long as fish are released unharmed between the end of October and mid-April. Most of the larger tributaries are occasionally fished, but generally the fish are not large enough to attract very many anglers.

In the past, ODFW stocked Waldo Lake with kokanee, eastern brook and rainbow trout. Stocking was discontinued in 1991 but fish populations are thought to be naturally reproducing. Due to a limited amount of primary productivity the Lake does not support a large fishery but the Lake does contain large fish that can be caught if one knows when and where to try.

Most of the larger wilderness lakes are still stocked with fish. The Erma Bell lakes are the most popular.

Wilderness

The watershed contains 9800 acres of the southwestern corner of the Three Sisters Wilderness Area and about 25,700 acres of the 36,000 acre Waldo Wilderness Area. These two Wilderness Areas are contiguous for the most part (in places they are divided by the non-wilderness Taylor Burn Road corridor) and are located in the upper reaches of the watershed.

Trails

The watershed contains some 160 miles of maintained trails. Most outside the wilderness are open to foot, horse and mountain bike use. About 21 miles of this trail system are open to motorbike use.

Developed Recreation

Five developed campgrounds exist in the watershed; North Waldo, Islet, and Shadow Bay campground are located on the eastern shore of Waldo Lake; Skookum campground is at the end of Forest road 1958 at the northern end of the Waldo Wilderness area; Kiahanie campground is located along the North Fork about 24 miles upstream from Westfir. Except for Skookum Creek campground, all are accessed by paved roads. Fees are charged for the use of these campgrounds. Primitive campgrounds with no use fees exist at Taylor Burn, Rhododendron Island, and Harralson Horse Camp.

Community-Based Recreation and Related Economic Benefits

Because the road leading to the North Fork and Aufderheide Drive leaves Highway 58 before reaching Oakridge, there is no direct contact between recreationists coming from Eugene/Springfield and local businesses. Local businesses are all located in the City of Oakridge about 4 miles past the turnoff to Aufderheide Drive. People approaching the North Fork from the East do pass through Oakridge.

Local residents have long enjoyed employment with companies and corporations extracting timber from Forest lands. Many recreate there as well, hunting, driving for pleasure, fishing, swimming, camping, sight seeing, and berry picking. Many local residents also rely on the area for firewood collection. When the last facilities at the Westfir Mill closed in 1983, and the Pope and Talbot mill in Oakridge closed in 1989, many residents, unable to locate well paying or steady jobs, left the area.

When the amount of land harvested per year diminished recently, people in the local West Fir/ Oakridge area were affected. Recreation activities and events outside the watershed (Willamette Pass skiing, Cycle Oregon, Fat Tire Festival) add a boost to the local economy. Although Aufderheide Drive and the associated North Fork Trail are becoming more popular, its full potential as an income-generating recreational facility for the Oakridge/Westfir area has yet to be realized.

Commodity Production

A substantial amount of timber has been harvested from this watershed over the years; 40 to 50 million board feet of lumber and plywood products, have been harvested annually since logging began in this area, for a grand total of about 3.1 billion board feet. This amount of harvesting and mill processing created many jobs over the years as further discussed in the FEIS for the Willamette National Forest Plan on pages III-213 to 235.

This timber harvest helped to supply the two mills that existed in the Oakridge/Westfir community. From 1924 to 1982 mill facilities existed in the City of Westfir. This mill site was abandoned after a series of fires which consumed most of the structures on the site. A mill built by the Pope and Talbot Company in the 1940's also existed in Oakridge until it was closed in 1989. The community immediately adjacent to this watershed still contains a number of people who make their living cutting, yarding, or hauling trees or working for the Forest Service in a timber production capacity.

ISSUES / KEY QUESTIONS

CHAPTER II

ISSUES AND KEY QUESTIONS

Introduction

Issues and Key Questions have been developed to identify the variety of uses and values associated with the watershed and to focus the analysis on those elements of the ecosystem most relevant to management questions (USDA, USDI, 1995). The issues identified in this Watershed Analysis are all focused around past, current, or expected future management activities occurring in the watershed and how those activities may have affected the current conditions and reference conditions as discussed in Sections III and IV of this analysis. It was recognized that regardless of physical characteristics there would be little potential for negative or positive effects and hence little need (other than procedural) for this analysis or the recommendations it might make, if only natural processes and events were occurring in the watershed. Of course, the activities occurring in the watershed do influence, and are influenced by, the physical, biological, and social characteristics described in this analysis in Sections I, III, and IV. Since each Issue (activity) may, and often does, affect a number of resources, there is a certain amount of overlap in discussions of these effects.

These issues were also focused on activities rather than on resource conditions because the main purpose of this analysis is to facilitate, direct, and support management activities and decisions, both by providing decision-makers with current resource information with which to make the most informed decisions, and by giving decision-makers an idea of the importance or priority of various potential management activities. Individuals who will use this analysis during project development should find this analysis to be user-friendly since they will be able to find direct reference to the activities they are contemplating rather than having to sort through a number of resource discussions to find references to the need for or impact of the activity(ies) in question.

Key questions have been developed for each issue. These are questions that need to be answered in order to facilitate an understanding of how management (human activities) may affect the processes occurring in the watershed. They are also those questions which most need to be answered in order for decision-makers to make fully informed decisions as to whether and to what extent various management and social activities should occur within this watershed.

Key questions are answered in the last two sections of this analysis: Interpretation and Recommendations. These conclusions are a synthesis, by issue, of the Current Conditions (Section III.), Reference Conditions (Section IV), and the answers to the Key Questions.

Issue #1

Intensity and pattern of vegetation manipulation related activities.

Timber harvest, the most prevalent vegetation management activity, had been occurring in this watershed over the past 70 years to provide lumber, resulting in a substantial economic benefit to local communities and the nation as a whole. Timber harvest and associated slash burning/disposal, reforestation, and precommercial thinning, in addition to vegetation manipulation done for wildlife habitat enhancement (such as forage enhancement activities like brush cut-back, seeding, and fertilizing) have played a significant role in shaping the vegetation patterns within this watershed. Of all the activities that manipulate vegetation, timber harvest in all its forms has had by far the largest role. The landscape patterns resulting from this vegetation manipulation may be considerably outside the range of conditions resulting from wildfire, the most significant natural modifier of vegetation in this watershed. In addition to the pattern of disturbance, the intensity of these activities, (or the percentage of the watershed affected per time period) may exceed the average natural level of disturbance for a similar time period by a factor

of two or more. Continuation of past harvest intensities could ultimately result in low amounts of forest being in a mature stand condition at any given time in certain areas within the watershed. The distribution of vegetation manipulation activities across the landscape, especially harvest of timber, may have had a profound effect on the amount of interior habitat through fragmentation of late-successional forests and isolation and/or removal of riparian forests. This may affect the dispersal of organisms across the landscape by reducing connectivity and caused a net reduction of late-successional forest due to edge effects.

The intensity of application (or rotation length if you will) for these vegetation management activities (again, especially timber harvest) may have had a profound effect on processes within this watershed. The amount of regeneration harvest implemented has been 32 percent over the past 70 years of management as compared to an average of 15 percent of stand replacement wildfire over the same period prior to management. This amount of vegetation disturbance has, to a certain extent, affected surface erosion and mass movement rates, increased peak stream flows, decreased water quality in a variety of ways, changed water yield, and have changed stream channel conditions, processes, and aquatic resources in general , and ultimately would eliminate late successional forests on all but those acres reserved from harvest (such as wilderness and other non-harvest allocations and reserves).

The intensity of management has also tended to simplify the structure of remaining or newly regenerated stands within and outside of riparian reserves and including stream channels. Most or all the large woody debris has been removed from some harvested stands. Regenerated stands were often, especially in the early years of harvest, planted densely to avoid reforestation failure. They were also typically planted with fewer species than occurred on the sites prior to harvest. Precommercial and commercial thinning have also tended to homogenize stands by making the tree spacing, diameter, and species distribution more uniform. Where late-successional forests still exist, some have been salvaged such that there are few snags and down logs remaining on the ground or in streams or certain species, as Pacific yew, were removed such that the remaining stands are simpler in composition than natural stands tend to be.

ISSUE #1 KEY QUESTIONS

1) Given current Forest Plan (as amended) land allocations, where and how many acres are available for vegetation manipulation (especially timber harvest)?

2) How has the intensity and pattern of vegetation manipulation (as compared to the change from prehistoric conditions) affected plant and animal habitat diversity, species composition, species viability, amount of interior habitat, habitat connectivity?

3) How has the intensity and pattern of vegetation manipulation (as compared to the change from prehistoric conditions) affected site productivity?

4) Where and to what extent has the change in spatial and temporal distribution of vegetation influenced the potential for water yield, water quality, and peak flow changes? Where have these changes in hydrology affected channel function and habitat condition?

5) What are the most important delivery mechanisms for sediment generated by vegetative disturbances in this watershed? What are relative rates of delivery by landform or slope to stream? Where are the high risk areas?

6) Where and to what extent has removal of existing and future sources of large wood material in stream channels changed the routing of sediment and in-stream habitat?

7) Where and to what extent has vegetation manipulation affected riparian habitat?

Issue #2

The exclusion of natural fire from the ecosystem has altered the natural processes.

Fire suppression has been occurring for the last seven decades in this watershed. Given the amount of land affected by fire over the last few centuries (see the fire frequency discussion under Issue #1), this suppression effort has so far effectively eliminated wildfire as a major shaper of vegetational landscape patterns and processes. This exclusion may have had a number of vegetational effects across the landscape; meadow sizes and abundance have been shrinking as trees encroach upon them, forest structure may have become more complex in some areas, the landscape distribution of natural forest age classes may have become less diverse in some areas, fire dependent species may have declined (such as lodgepole pine, Montia diffusa, and Astragalus umbraticus. Fuel loading across the landscape may have increased in some areas. However, as described in Issue #1, other areas have been treated with activities that reduce fuel loading.

The effects of fire exclusion on the vegetation in this watershed may have several negative consequences on long-term landscape processes. Increasing fuel accumulations will ultimately result in more frequent, more severe, larger, and less suppressible wildfires. This may be of special concern within the LSR where there is much less opportunity for vegetation management activities to modify fuel accumulations and where there is or will be more contiguous fuel beds accumulating. Continued fire exclusion could also result in an increase in insect and/or disease outbreaks on harsher sites where dense stands may develop in the absence of fire and changes in long-term site productivity, positively as more organic material accumulates and negatively as fires burn more intensely. Fire exclusion may also have increased the habitat available for T E and S species such as spotted owls as forests develop more complex structurally in terms of understory layers and snag and down wood accumulation due to fire exclusion, but there could also be some long-tern detriments to late-successional habitat if wildfire extent and severity increase due to fuel accumulation.

ISSUE #2 KEY QUESTIONS

1) Fire pattern, fire behavior, and burn intensity are affected by fuel loading conditions. How do current conditions compare to fuel loading conditions before the advent of fire suppression? What areas are at high risk.

2) If we provided for prescribed fire within established forest stands (as opposed to bare ground for site preparation) in order to reduce high fuel loading, and to bring the landscape fuel loading back to a natural range of variability, under what conditions could we control the fire? How many acres (per period of time) could need to be burned (by land allocation) and remain within air quality limits?

3) Under a prehistoric (pre-fire suppression) fire regime, what would the habitat diversity look like?

4) How would disturbance mechanisms associated with prescribed fire affect TE&S species, as well as fire dependent species?

Issue #3

The density and conditions of roads and trails has altered the landscape processes.

This watershed currently contains 570 miles of system and non-system roads and 160 miles of maintained trails. Approximately 6 miles of these road are seasonally closed for a variety of reasons, the most common of which is to avoid traffic related wildlife disturbance. Approximately 2 additional miles of road is closed year around except for administrative use (especially fire suppression). This extensive road system is for the most part a direct result of past timber harvest as discussed in Issue #1 but this system also provides for administrative access including that for fire suppression, and recreational access. The roads in this system were general designed for a 20 year service life. For many roads this designed service life has been exceeded and the road surface, ditches, and/or culverts are beginning to

deteriorate. The Northwest Forest Plan ROD specifically prescribes that road densities in key watersheds remain at current levels or be reduced and that drainage structures be designed to accommodate 100 year return peak flows.

Like timber harvest, roads remove vegetation and hence can also increase peak flows as discussed under Issue 1 and by providing for more efficient slope drainage. Road may also increase the amount of mass movement magnitude of peak stream flow as roads often intercept and re-direct the overland and sub-surface flow of water. Such hydrologic effects can also eliminate or create wetlands or change the hydrologic character of special habitats (for example the drainage of a moist meadow). Roads can also affect the connectivity of habitats; they fragment habitat for organisms that find it difficult to cross small, bare openings and due to the often impassable nature of stream culverts. Roads also can be a disturbance vector for wildlife sensitive to noise or human presence.

As much as an extensive road system may create some detrimental environmental conditions, the extensive access opportunities can also have some beneficial impacts in providing large areas for various recreational activities such as hunting, dispersed camping, access to trailheads, and driving for pleasure. Road closures can limit these opportunities and concentrate use in areas with more open roads which in itself could potentially create resource problems. Local economies can also be affected, both positively an negatively, by increasing or decreasing the amount and ease of access, by changing traffic patterns, recreational uses, or the availability of firewood and special forest products.

Maintaining the current road system is also a fairly expensive proposition. There is not now money available to keep all system roads maintained for safe and pleasant use and roads that are not properly maintained can cause some fairly serious resource problems such sediment delivery to streams from as ditch and roadbed erosion. A portion of this road system is deteriorating and no funds are now available for proper maintenance. Maintenance needs, including culvert upgrading, for this road system need to be prioritized to most effectively make use of the limited maintenance funds. The Northwest Forest Plan standards and guidelines also require that existing culverts, bridges, and other stream crossing structures which pose a substantial risk to riparian conditions are to be improved to accommodate at least a 100 year flood event. Most stream crossing structures do not meet this design criterion and correcting this situation would entail a substantial cost that is not now funded.

There are also about 52 miles of non-system road that do not meet current standards for management. Recovery and growth of riparian vegetation immediately upstream from bridges and large culverts could result in the accumulation of large amounts of woody debris which could ultimately affect the viability of the stream crossing structure as well as down-stream resources should the bridge or culvert fail as the result of debris accumulation.

Trails, though they do not have the actual or potential effects that roads can have on resource conditions, may also contribute some sediment to the stream system. Trail use may also degrade water quality. Trail maintenance funds are also limited and several historic trails have been abandoned due to lack of use (due in large part to the fact that roads typically have cut these trails into several to many segments) and/or lack of funding. User conflicts also have occurred along some trail segments, particularly related areas where trails pass close to or through dispersed camping sites. Such conflicts have been addressed in the North Fork Wild and Scenic River Plan. There are opportunities to provide more trail use opportunities (for foot, horseback, bicycle, and trailbike use) when deciding which roads should be closed and how to close them.

ISSUE #3 KEY QUESTIONS

ROADS

System and Non-System

1) Where and to what extent has the density and condition of roads influenced natural and management induced disturbance (i.e. landslides, surface erosion, slope movement)?

2) What sections of roads are currently or potentially introducing excessive amounts of sediment to the stream system? Where and to what extent does the influx of sediment influence channel conditions?

3) Where and to what extent has the density and configuration of roads affected surface and subsurface hydrology (i.e. wetlands, expansion of the drainage network, etc.)?

4) Where are high risk or high priority road/stream crossings which do not have drainage structures designed to withstand 100 year events?

5) Since funding is no longer available to maintain the entire existing road system to designated levels, what are the potential resource effects of not maintaining all the roads in this road system?

6) Where and to what extent have roads (especially Aufderheide Drive) affected habitat connectivity and riparian reserves?

7) Where and to what extent have roads affected wildlife populations (points to consider: disturbance, poaching, etc.)?

8) Where and to what extent have roads affected special habitats?

TRAILS

9) Where and to what extent has the condition and use of trails influenced disturbance (i.e. surface erosion, slope movement, landslides)?

10) Where and to what extent are the trails and their use affecting wildlife and botanical values and where and to what extent have wildlife and botanical values affected trail use (via resource protection closures)?

ACCESS

11) How does changed access influence potential human caused fire ignitions and suppression response time for all fires (change in NFMS results)?

12) How does changed access affect public and administrative use of forest and local economics? (include abandoned trails and historic sites)

Issue #4

The introduction and spread of non-native species is affecting the native flora and fauna.

A number of plant and animal species have been introduced into this ecosystem during the period of European occupation. Some species have been introduced accidentally or on purpose by past livestock grazing, some for revegetation and erosion control along roads and other bare soil areas, some for human use and consumption.

These non-native species can and do cause a range of negative effects from supplanting or preying upon native species to impeding travel of human and wildlife. Some species may also have beneficial effects; they may serve as forage or a prey base for native species, provide for human hunting or gathering opportunities, or can be used to control other non-native species that are producing negative effects. There is particular concern when the presence of these non-native species affects the viability of threatened, endangered or sensitive species such as the Oregon chub and the western pond turtle.

Many of these species are continuing to expand their range in this watershed and have the potential to eventually overwhelm some native plant and animal communities. Roads and trails may be the vector of some of this expansion as seed may be transported by livestock, vehicles, or their occupants. The existence and spread of these plants and animals have the potential to affect recreation use, the economics of forest product utilization, or economic values on adjacent private lands (weeds in agricultural lands for example).

There is a potential for non-native fish species to migrate up the North Fork from the Middle Fork now that the Westfir Dam has been removed. It is not though that species such as crappie or large mouth bass would move upstream due to low water temperatures.

ISSUE #4 KEY QUESTIONS

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

2) What is the social, biological, and economic effect of introduced non-natives?

Issue #5

Need to restore and maintain the habitat for future reintroduction of salmon and bull trout.

Spring Chinook salmon, steelhead trout, and bull trout have been eliminated from this watershed. It seems likely that some time in the future (but not immediate future), salmon and steelhead passage over existing dams will be provided. The habitat available to these fish in that event is not now of as high a quality as it once was. Opportunities exist to develop higher quality habitat such that any future reintroduction's would be more successful and provide for a maximum number of surviving individuals.

Of particular concern is the existence of stream channels with complex enough structure to provide for spawning habitat and juvenile rearing habitat. Some structural elements already exist and opportunities exist to create additional structures. Existing barriers to upstream fish movement may also be removed. Competing or predator species may have to be managed to provide for future successful reintroduction.

Such reintroduction's would have some positive social and economic impacts in terms of providing more diverse and economically attractive recreational activities, in addition to a potential increase in local community property values and an increase in the number of fish available for harvest downstream and in the ocean. Reintroduction of salmon, steelhead trout, and bull trout could also create some negative effects such as increased recreational impact in riparian areas, conflict between river users (specifically kayak and raft users) and the creation of in-channel structures.

ISSUE #5 KEY QUESTIONS

1) What are the potential social and economic effects of habitat restoration for and re-introduction of salmon, steelhead trout, and bull trout?

Issue #6

There is a demand for products from forest land (other than timber).

Commodity extraction not associated with the harvest of conventional timber products has been occurring in this watershed since humans have entered the area. These commodities include a large number of forest plants typically referred to as Special Forest Products (the ones most commonly harvested tend to be beargrass, ferns, salal, mushrooms, boughs, cones, Christmas trees, seeds and prince's pine, scion and cone collections for genetic improvement programs); in addition to mining for rock, minerals, and metals; extraction of water for municipal use (including sewage disposal); firewood;

quarry rock; post and poles; cedar bolts; and specialty woods. Demand for some of these products has increased in recent times and may continue to increase in the future. Current or future levels of use could cause resource impacts. Extraction of these products within certain land allocations such as LSRs and riparian reserves may not be compatible with land management goals.

ISSUE #6 KEY QUESTIONS

1) Where are forest products (other than timber) located in the watershed?

2) Are there conflicts between this product extraction and meeting land management objectives and where and to what extent is harvest of these products appropriate?

Issue #7

There is an existing infrastructure in this watershed that may have an effect on watershed values and processes.

A number of administrative, community oriented, and industrial infrastructure facilities, some associated with special use permits, occur within this watershed. These facilities include but are not limited to railroad, power line, and road rights-of-way, developed recreation sites (five campgrounds and Aufderheide Drive interpretive sites), a water treatment plant, residences on federal land, two fire lookouts, a guard station, stream gauging stations communications site, various helispots, numerous dispersed recreation sites, the historic Klovdahl tunnel at Waldo Lake, and various water sources used mostly for fire suppression and road maintenance. These uses may or may not have effects on the resource values contained in this watershed.

ISSUE #7 KEY QUESTIONS

1) Where are existing infrastructure land uses and where are additional uses likely to occur in the future?

2) Do the presence and use of these facilities affect the resources contained in the watershed, including riparian functions and water quality?

Issue #8

Waldo lake area access and travel management.

The methods and patterns of access within the Waldo Lake basin has become an area of key public concern over the past decade. The issue as to whether or not motors should be permitted on Waldo Lake was the single most mentioned issue specific to a particular location mentioned in public input to the 1990 Willamette National Forest Land and Resource Management Plan (Forest Plan). Gasoline powered motors are currently allowed on the Lake which has a speed limit of 10 miles an hour imposed by the State Marine Board. The debate as to whether motors should be used on the lake centers around the fact that the purity of Waldo Lakes water is unique on a global scale.

A number of diverse recreational uses occur in this basin, such as hiking, backpacking, cross-country skiing, horseback riding, mountain biking, snowmobiling, boating of all types on Waldo lake, lake-side dispersed camping, in addition to cars, trucks and RVs using the existing paved road system. These uses are often seen as conflicting and some may have resource impacts, especially if recreational use in the basin increases in the future, which is considered to be very likely. The most common use conflicts in the basin occur between motorized and non-motorized travelers on both land and water surfaces (particularly on Waldo Lake itself and over-the-snow travelers) and between conflicting types of non-motorized travel (hiking with mountain biking with horseback riding). This use may also affect or has the potential to affect TE & S habitat, water quality in Waldo Lake, and air quality.

Restriction of certain types of access in some areas of the basin could limit or improve recreation opportunities (especially by reducing user conflicts or providing opportunities for the elderly or disabled), make administrative access more difficult, and affect the safe use of the Lake if rescue activities would be hampered by vehicle prohibitions. Changing access patterns could also improve recreational opportunities by minimizing user conflicts (such as those that typically occur between cross-country skiers and snowmobilers) and could also affect local traffic patterns to the detriment of local businesses (as in the potential effect on the communities of Crescent and Crescent Junction should the Charleton Butte road be improved).

ISSUE #8 KEY QUESTIONS

1) What are potential impacts from recreation use? (Noise, water and air quality, sediment, affect on TE&S and unique species, user groups)

2) What opportunities exist to better provide for a range of quality recreation experience with lesser amount of user conflict? (address access for all user groups)

3) What motorized and non-motorized boating opportunities exist within the immediate surrounding area?

4) What is need for administrative and emergency access?