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LAWSON CREEK WATERSHED ANALYSIS

ITERATION 2.0

I have read this analysis and find it meets the Standards and Guidelines for watershed analysis required by The Record of Decision for Amendments to Forest Service and Bureau of Land Management Planning Documents Within the Range of the Northern Spotted Owl. (April 1994)

SIGNED Bonnie J. Wood DATE April 4, 1997
District Ranger
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Watershed Analysis Summary

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Introduction

The Lawson Creek Watershed Analysis, Version 2.0, was initiated to obtain and document information on the aquatic, terrestrial and social resources of the watershed. Version 1.0 was completed in May, 1995 and was used to initiate road treatment projects that would benefit aquatic and riparian resources. The information gathered and analyzed in Version 2.0 will be used to guide future resource management. It will also be used to ensure Aquatic Conservation Strategy Objectives and other Standards and Guidelines contained in the Record of Decision for Amendments to Forest Service and Bureau of Land Management Planning Documents Within the Range of the Northern Spotted Owl (ROD, 1994) will be met.

The watershed analysis was completed by an interdisciplinary team using the six step process outlined in *Ecosystem Analysis at the Watershed Scale (Version 2.2, August 1995)*. The watershed analysis has the following components: the aquatic ecosystem, the riparian ecosystem, the terrestrial ecosystem, and the social aspects of the watershed. These components are separated in the watershed analysis report; however, in the analysis process they are very much interrelated. This watershed analysis report contains a summary section followed by a narrative section. Each covers the same topics with the narrative section providing greater detail.

Lawson Creek Watershed

The Lawson Creek watershed was designated as a Key Watershed by the ROD. Key Watersheds serve as refugia that are crucial for maintaining and recovering habitat for at-risk species and stocks (ROD, B-12, B-18). Lawson Creek is an important tributary to the lower Illinois River. It flows into the Illinois River 3.5 river miles above the confluence of the Rogue and Illinois Rivers at the community of Agness. Agness is about 30 miles east of the Pacific Ocean. The Lawson Creek watershed is located in Curry County and is about 25,241 acres. The entire watershed is managed by the Siskiyou National Forest except 250 acres of private land. Vehicle access to the watershed from Gold Beach is via Forest Service (FS) Road 33 (Agness Road), FS Road 3318 and FS Road 3680.

The Siskiyou Land and Resource Management Plan (Siskiyou LRMP, 1989) as amended by the ROD, 1994, allocated the watershed into a variety of management areas. (Table 1 and Figure 2) These documents provide information and overall resource management direction for the National Forest portion of the watershed. A large portion of the watershed is allocated to Late-Successional Reserve (LSR) and is a part of the Fish Hook/Galice LSR. The Southwest Oregon LSR Assessment provides more specific information and resource management direction for this LSR.

Table 1. Management Areas and Acreage in the Watershed. (See Figure 2)

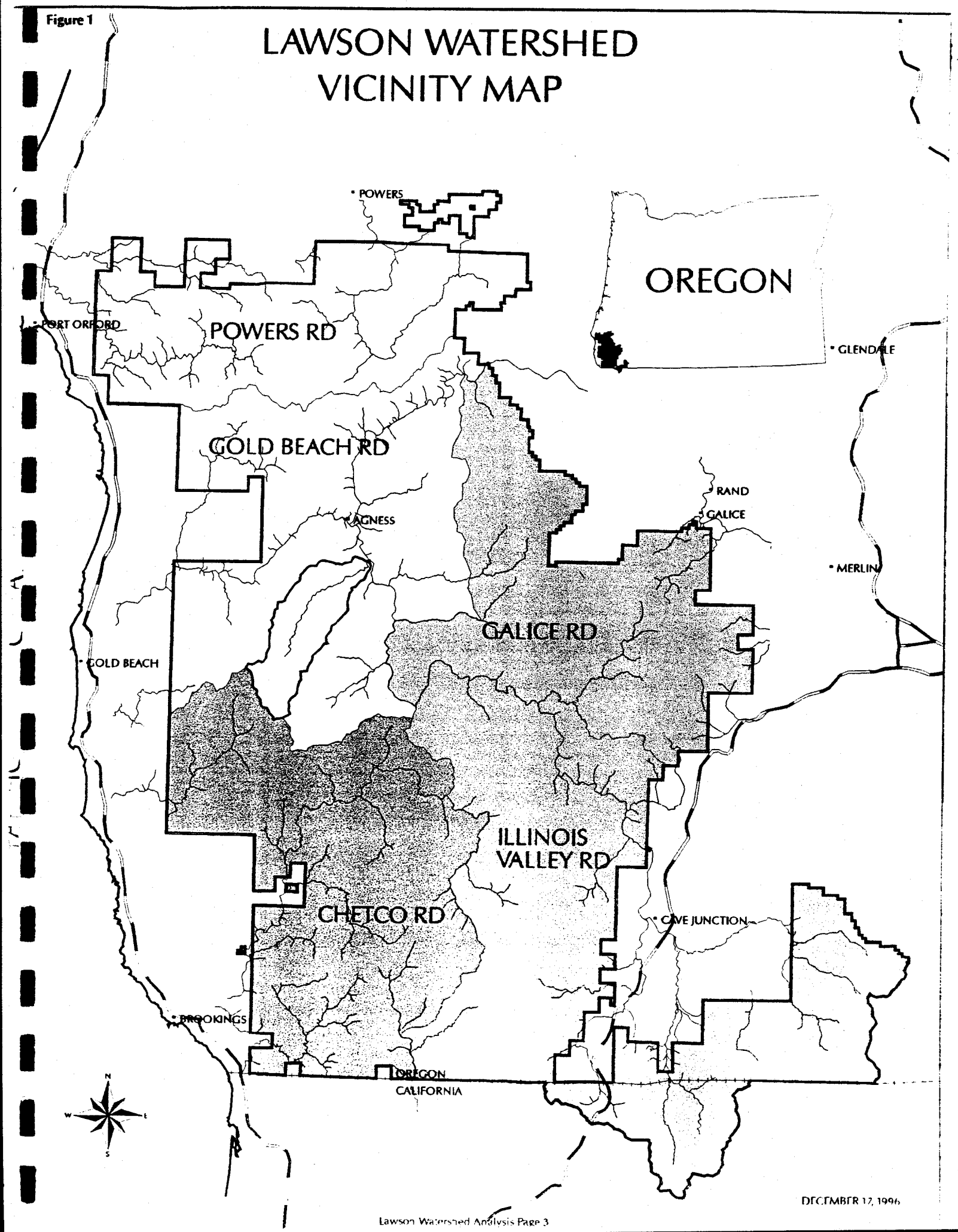
Allocations	*Management Area*	*Acres*	*Percentages*
Wild River	2	59	<1
Botanical	4	559	2
Unique Interest	5	283	1
Backcountry Recreation	6	3548	14
Supplemental Resource	7	1164	5
Late Successional Reserve	8	11354	45
Special Wildlife Sites	9	115	<1
Riparian Reserves	11	1747	7
Retention Visual	12	459	2
Partial Retention Visual	13	1299	5
Matrix	14	4412	17
Private		250	1
Total National Forest Land		**24,991**	**99**
Total Non-National Forest Land		**250**	**1**
Total Acreage		**25,241**	**100**

Watershed Analysis Summary

The following section summarizes the information obtained in the watershed analysis. Summary tables for the aquatic, riparian, terrestrial ecosystems and the social aspects of the watershed are presented. Key questions concerning the various resources, the existing condition, objectives, priority locations, and management opportunities are described. The summary concludes with the Key Findings for the Lawson Creek Watershed Analysis.

Figure 1

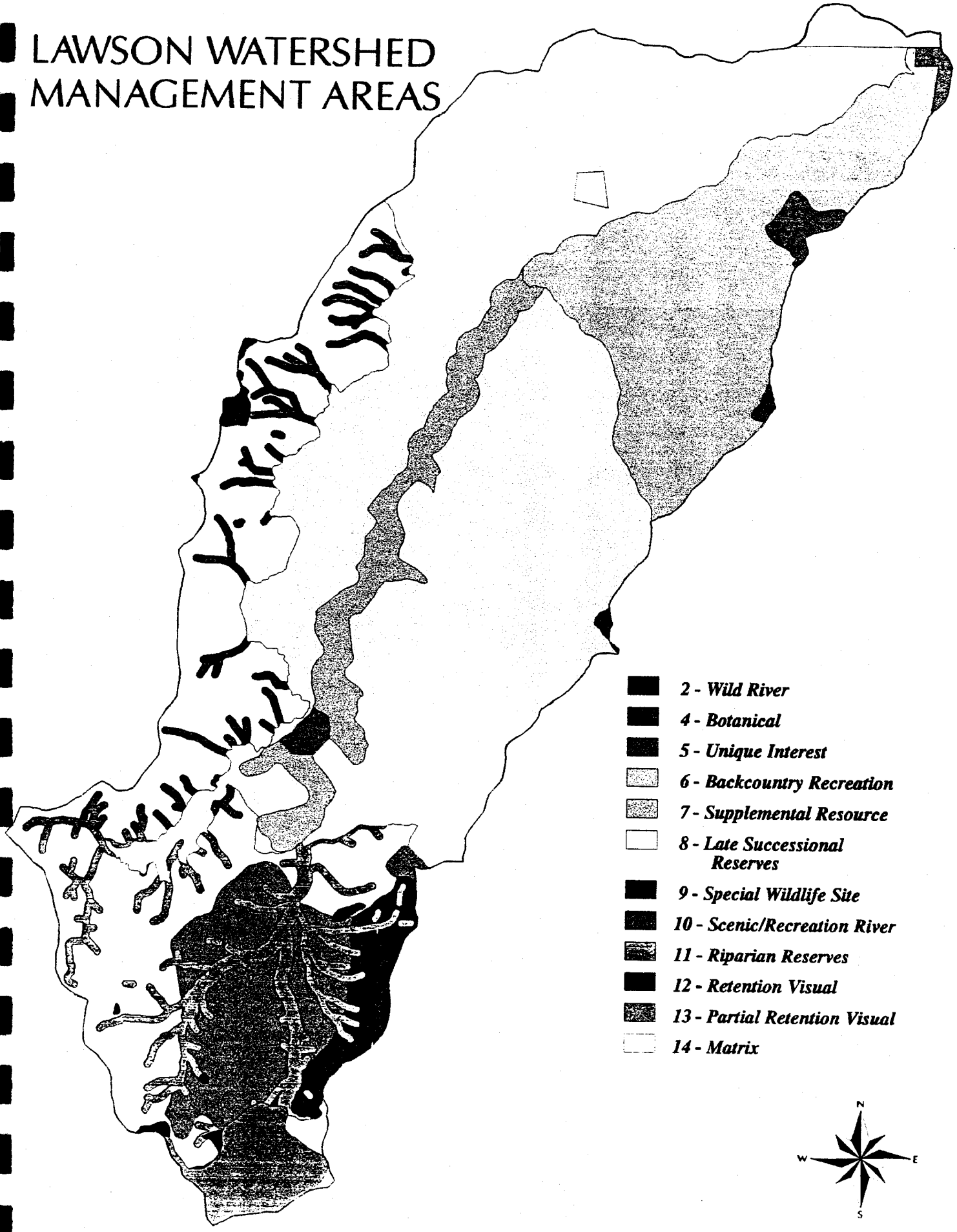
LAWSON WATERSHED VICINITY MAP



DECEMBER 17, 1996

Figure 2

LAWSON WATERSHED MANAGEMENT AREAS



DECEMBER 17, 1996

KEY QUESTION	EXISTING CONDITION	OBJECTIVES	PRIORITY LOCATIONS	OPPORTUNITIES
What erosion processes are dominant within the watershed?	Natural processes dominate within the watershed. Portions of North Fork and South Fork have been affected by landsliding and erosion caused from timber harvest and road construction.	Reduce sediment delivery from roads. Restore natural sediment regimes.	Roads that have the highest probability of diverting runoff and delivering sediment to streams.	Evaluate roads for decommissioning. Repair roads to improve drainage.
What are the dominant hydrologic characteristics and processes?	High rainfall and transient snow zone create high winter flows. Low summer flows are average for the geographic area.	Harvest and road construction may have increased peak flows in some tributaries.	Watershed Analysis Area's (WAA's) 9, 10, 17	Evaluate roads for decommissioning. Repair roads to improve drainage. Evaluate plantations for vegetation treatment needs.
What are the basic morphological characteristics of stream segments and the general sediment transport and deposition processes?	Channels are confined and steep. Tributaries tend to be transport systems. The mainstem and South Fork are powerful transport streams with some depositional reaches. The North Fork has long depositional reaches susceptible to aggradation. The North Fork has been altered by human activities (harvest and road construction). The South Fork and mainstem have greater stream power and the results of human activities have been overshadowed by natural processes (floods, landslides, fire).	Restore natural processes in channels altered by human activities.	Depositional reach above river mile 2.0 of the North Fork and tributaries to this reach.	Evaluate feasibility of channel restoration.
What beneficial uses dependent on aquatic resources occur in the watershed, and what parameters relate to them?	The anadromous fishery is the beneficial use. The temperature parameter is warm and may be limiting for salmonids and is primarily a result of natural processes.	Lower stream temperature where feasible.	Riparian areas within managed stands.	Plant or thin to improve shade quality.

AQUATIC ECOSYSTEM (continued)

KEY QUESTION	EXISTING CONDITION	OBJECTIVES	PRIORITY LOCATIONS	OPPORTUNITIES
What is the physical and biotic character of fish habitat in the watershed?	**Migration habitat.** There are no known barriers to migration caused by culverts in the watershed. There are natural barriers to fish passage in the form of cascades and/or waterfalls. Along the mainstem of Lawson barriers occur at river mile (RM) 3.8, 5.6, and 8.5. There are also waterfalls in the North and South Forks that are definite barriers to resident fish. **Rearing habitat.** Stream temperatures in the lower mainstem are warm. Macroinvertebrate samples that have been collected near the mouth show there is a notable absence of cool/cold water taxa, and a few warm water indicators were present. Pool depths are good for juvenile rearing purposes. Overhead and instream cover were not found to be a major component of rearing habitat. Most cover occurred in the form of substrate and turbulence. **Spawning habitat.** Quantitative information on spawning habitat in the watershed is limited.	Maintain high quality habitat and improve degraded habitat.	Throughout the watershed.	Further evaluation and quantification of habitat in low gradient reaches.
What is the distribution of fish in the watershed?	Redside shiner 1.54 miles; Threespine stickleback 1.54 miles; coho salmon 4.18 miles; Fall chinook salmon 4.18 miles; Winter steelhead 9.51 miles; Sculpin 9.51 miles; Coastal cutthroat 20.69 miles; resident Rainbow trout 20.69 miles.	Protect habitat for at-risk fish stocks.	Throughout the watershed.	Riparian planting and precommercial thinning. Road decommissioning.

RIPARIAN ECOSYSTEM

KEY QUESTION	EXISTING CONDITION	OBJECTIVES	PRIORITY LOCATIONS	OPPORTUNITIES
What are the riparian processes in the watershed?	Nutrient energy sources, autochthonous and allochthonous, have a major influence on the structure and function of stream ecosystems. Intermittent channels provide seasonal sources of water, sediment, allochthonous material, large wood, travel corridors, and microclimatic refuge for mammals and amphibians. **Conifer forest** is the most abundant riparian type in the watershed. Most human impacts have occurred here, and it is the most important riparian type for microclimate and wildlife dispersal. **Hardwood riparian** stands occur when water is limiting or the fire regime favors them. These stands most frequently surround seasonal streams and have less distinctive microclimates. **Meadow riparian** areas have open canopies and provide little microclimate, but add to downstream aquatic diversity. Most have been encroached upon by conifers. **Ultramafic riparian** stands have an open to moderately closed canopy. Therefore, seasonal and diurnal temperatures fluctuate more than in other riparian stands. Port-Orford-cedar is often the primary overstory component.	Preserve or restore riparian processes.	Where activities have altered riparian processes. Where management activities are proposed in or adjacent to Riparian Reserves.	Restore altered riparian processes. Implement activities within Riparian Reserves or adjust interim Riparian Reserve boundaries where appropriate. This can only occur when riparian processes are preserved and Aquatic Conservation Strategy objectives and wildlife dispersal objectives are met. Activities and/or adjustments are more likely to occur in intermittent Riparian Reserves due to the high variability of these stream processes.

TERRESTRIAL ECOSYSTEM

KEY QUESTION	EXISTING CONDITION	OBJECTIVES	PRIORITY LOCATIONS	OPPORTUNITIES
What is the historical and existing late-successional stage distribution in the watershed?	Approximately 36 percent of the Lawson watershed provided late-successional habitat in the 1940's, prior to any timber harvest. About 47 percent of the Lawson watershed is presently in late-successional forest. Currently, interior late-successional habitat represents 25 percent of the Lawson watershed, up from 21 percent in the 1940's. This indicates there are greater amounts of late-successional habitat now than in the 1940's with projections for even higher proportions of late-successional habitat in the future. This increase in late-successional habitat is in compliance with the ROD for Late-successional reserve. Although Lawson appears not to be the highest priority for stand treatment on the forest because of relatively good late-successional habitat conditions, there may be opportunities for continued enhancement.	Accelerate the growth and development of early through mid-seral stage stands to increase block size of older forest and interior forest habitat in the future.	The highest priority for stand treatment to improve late-successional habitat are those mid-seral habitat stands adjacent to existing large late-successional habitat blocks, habitat connections or mid-seral stands within the mean home range of northern spotted owl activity centers. The next priority is mid-seral habitat stands that will contribute to the landscape pattern of future late-successional forest habitat. Another priority are the younger, densely vegetated managed stands within owl habitat, wildlife corridors and adjacent to remaining old growth forest blocks.	Development of late-successional structure can be accelerated in managed and natural stands through commercial treatment for stand density. Precommercial thinning and release of managed stands could also benefit the development of future late-successional owl habitat, wildlife corridors and fragmented core blocks. Complete surveys and evaluate feasibility to determine if other stands could benefit from stand treatments in the future.
What are the special/unique habitats in the watershed and how are they changing?	Meadow areas are being reduced in size by tree encroachment largely due to the exclusion of fire. Lakes, ponds, springs, talus areas, cliffs and rock sites are maintaining their current sizes. Ponderosa pine and Brewer spruce populations are present in the watershed, occurring at the western edge of their distribution.	Restore meadow, oak savanna and ponderosa pine habitat. Protect sensitive plant species, Brewer spruce populations and their habitat.	Sevenmile Meadow, Pebble Hill Meadows, MD-272, MD-273, Megs Meadow, Fairview Meadows and Wildhorse Meadow. Ponderosa pine: Pine Grove Trail/Pebble Hill area. Brewer spruce: Huntley Springs and near Game Lake.	Cut, girdle, or cut and remove encroaching trees in and around meadows, oak savanna, and ponderosa pine areas. Manage with a prescribed fire program. Seed disturbed areas with native grass seed. Assess for hazardous fuels build-up near Brewer spruce.

KEY QUESTION	EXISTING CONDITION	OBJECTIVES	PRIORITY LOCATIONS	OPPORTUNITIES
What is the relative abundance and distribution of the species of concern in the watershed? What is the distribution and character of their habitats?	The following endangered or threatened species have been observed in the watershed: bald eagle, northern spotted owl and marbled murrelet. The watershed contains the eastern most population of murrelets on the Gold Beach Ranger District. Large unfragmented blocks of late-successional habitat is important for spotted owls as well as a wide variety of late-successional related species including neotropical migratory birds. Eighty-five percent of the watershed has a near-natural snag level, the remaining 15 percent has been harvested and has a low number of snags. The following sensitive species have been observed in the watershed: Del Norte salamander, California mountain kingsnake and Western pond turtle. Habitat for the following sensitive species occurs in the watershed: red-legged frog, white-footed vole, Townsend's big-eared bat and wolverine. The following sensitive plant species have been documented in the watershed: *Allium bolanderi* var. *mirable*, *Bensoniella oregona*, *Carex gigas*, *Hieraceum bolanderi*, *Lupinus tracyi*, *Poa piperi*, *Sidalcea malvaeflora* ssp. *patula*, *Erythronium howellii*, and *Triteleia hendersonii var. leachiae*.	Maintain or increase populations of these plant and animal species by maintaining or increasing habitat capability within the watershed.	Protect or enhance known sensitive species sites. Develop potential late-successional habitat areas for spotted owls and other species that use late-successional habitat. Priority areas include those that will contribute to the development of large blocks of interior late-successional habitat especially around spotted owl activity centers. Maintain and improve unique habitats.	Protect or enhance known sensitive plant and animal sites. Develop spotted owl structure within stands. Improve habitat conditions for late-successional dependent species by developing recruitment/potential habitat stands. Protect existing snags and create new snags where feasible. Restore and maintain meadows and oak savannas.

KEY QUESTION	EXISTING CONDITION	OBJECTIVES	PRIORITY LOCATIONS	OPPORTUNITIES
What are the locations and risk of spread of noxious weeds?	Five noxious weed species currently inhabit the watershed and two additional species occur in neighboring watersheds. Most populations are currently restricted to roadsides, harvest areas, landing sites, and streambeds. Two species (Scotch broom and gorse) exist in low enough numbers that treatment can limit their populations. The aggressive nature of these weed species threatens native plant communities and sensitive plant species. French broom occurs nearby and may be spread into the watershed soon. Yellow star thistle and meadow knapweed, although not currently in the watershed should be watched for. Canada thistle, bull thistle, and tansy ragwort are established in the watershed and pose a lesser threat because they have already long occupied many of the watershed's disturbed sites.	Minimize impact of noxious weeds by restricting their spread and introduction to new sites. When possible eradicate species that are not well established in the watershed.	The largest scotch broom site in the watershed occurs at milepost 21 on road 3680. Its size and location make it a key site to watch for noxious weeds. Scotch broom also occurs on the 3318 road system at several locations, at the Wildhorse lookout and on road 3318.130. Gorse colonies have been treated at 3680.402a, along 3318 near Wildhorse Prairie, at road 3318.222, and at the landing at the end of 3318.240. These sites will require monitoring to prevent recolonization by gorse seedlings.	Cut/pull/burn colonies of gorse and scotch broom, and other noxious weed sites that may be new to the drainage. Monitor existing sites for reoccurrence. Clean construction machinery before and after operation. Use only "clean" fill material and "certified" weed free hay. Seed disturbed soils with native seeds to reduce the risk of noxious weed establishment. Reduction of soil disturbance (i.e. ripping roads) in weed infested areas will help control populations. Use of biological controls (especially for tansy ragwort and Canadian thistle) will help control populations.
What are the locations and risks of spread of phytophthora lateralis (Port-Orford-cedar root disease) to Port-Orford-cedar in the watershed?	Port-Orford-cedar occurs in higher quantities than the adjacent Quosatana watershed, mostly in riparian areas and wet serpentine sites. The disease is limited to the mainstems of the South and North Fork and a few tributaries. Since the disease was introduced 20 to 30 years ago, spread has slowed but still occurs. The watershed, along with Collier and Windy Creeks, are a transition area from heavier disease infestations to the north to more limited disease.	Reduce disease risk; maintain healthy riparian cedar component.	Treat individual trees, upslope areas, and remaining uninfested tributaries, especially east side of Wildhorse Ridge and selected tributaries west side of Road 3680.400. See road ratings list. Priority for planting is North Fork (depleted of large wood) and ultramafic riparian areas with reduced shade due to loss of POC (North and South Fork).	Cut Port-Orford-cedar from edges of roads. Closure of roads. Clean equipment before operations. Restrict uses to dry season. Use uninfested water in firefighting, other activities. Place lift of rock on scattered infested road sites. Plant resistant/general stock at low-risk riparian sites.

KEY QUESTION	EXISTING CONDITION	OBJECTIVES	PRIORITY LOCATIONS	OPPORTUNITIES
What are the locations and risks of spread of five-needle pine blister rust in the watershed?	White pine and its associated blister rust disease occur in higher quantities than the adjacent Quosatana watershed. Sugar pine occurs in similar quantities to adjacent watersheds. High stand density in these pine sites is increasing the risk of stress and introduction of bark beetles and blister rust. The disease is most extensive at sites that collect high amounts of summer fog (ridgetops).	Reduce disease risk; maintain healthy 5-needle stand components.	Upslope/ridgetop areas, and serpentine white pine sites with high stand density. Especially near Snow Camp Mountain and Collier Butte.	Reduce stand density through thinning and fire. Plant resistant stock (evaluate in botanical area)
What is the fire history of the Lawson Creek watershed and what is the future role of fire in the watershed?	During the prehistoric period, there is evidence that multiple, low intensity fires were more prevalent in the watershed than isolated stand replacement fires. More exact data and interpretation for this period is not available. Around 1917, two human-caused fires burned about 10 percent of the area. Since that time, twelve lightning-caused and ten human-caused fires have burned, none larger than 10 acres. Native Americans and early settlers used fire for manipulating and maintaining vegetation. For the past 75 years, fires in the watershed have been suppressed. The effects of this exclusion are becoming evident in the meadow areas, and possibly in other unique habitats.	Maintain the natural processes of fire in the ecosystem. Determine where fire exclusion is contributing to the degradation of certain plant communities and unique habitats. Determine conditions and fire intensity levels that would provide benefits to these areas.	Encroached meadows, special and unique habitats, late-successional habitats are priority areas. Other areas in the watershed may also benefit.	Prescribed fire can be used to achieve the management objectives for special and unique habitats, Late-Successional Reserves, and other land allocations. Fire management plans need to be completed to determine conditions where prescribed fire will be used in the Late-Successional Reserve.

SOCIAL ASPECTS

KEY QUESTION	EXISTING CONDITION	OBJECTIVES	PRIORITY LOCATIONS	OPPORTUNITIES
What were the prehistoric uses of the watershed?	Known sites indicate seasonal use of the watershed for hunting, fishing, and gathering foodstuffs, and obtaining raw materials for stone tool manufacture, basket making, woodworking etc. Trade and travel routes traversed the watershed. Oak Flat, across the Illinois River from the mouth of Lawson, was the main winter village. Game Lake was probably used for a summer camp with additional areas being used for short-term traveling camps.	Identify and protect cultural resources.	Meadow areas, major dividing ridgetops, chert outcrops and riverine terraces on all major watercourses.	Conduct cultural resource surveys prior to any ground disturbing projects. Identify, document and evaluate any discovered sites for the Forest inventory and possible inclusion to the National Register of Historic Places. Suitable cultural resource properties may be interpreted for the recreational use and education of the public.
What were the historic human uses of the watershed?	Historic elements represent early settlement, mining for precious or strategic minerals, and early Forest administration. Travel routes often followed aboriginal paths and were established during the mining period. Many of these routes evolved into administrative and recreational roads and trails. The 1915 Siskiyou National Forest map shows Ranger Stations at Wildhorse Prairie and Game Lake with a trail going to these locations from Agness. The 1937 map shows the first jeep road going up the Pistol River drainage to Pyramid Rock Lookout and on to Wildhorse Prairie Ranger Station and Wildhorse Lookout.	Identify and protect cultural resources.	Wildhorse Prairie, Wildhorse Lookout, as well as other meadows in the watershed. Trails, remnant jeep trail, mining roads and former trails located on historic Siskiyou National Forest maps.	Conduct cultural resource surveys prior to any ground disturbing projects. Identify, document and evaluate any discovered sites for the Forest inventory and possible inclusion to the National Register of Historic Places. Suitable cultural resource properties may be interpreted for the recreational use and the education of the public.
Does the watershed contain any culturally significant traditional use areas?	No evidence suggests that the watershed is presently used for traditional activities by local Indian groups. The local recognized tribes (Tolowa, Karuk, Coquille and Siletz) were consulted and did not provide additional information regarding traditional use in the watershed.	Manage traditional use or religious sites in coordination with American Indian tribal groups. Recognized tribes will be contacted during the public involvement phase of project planning.	None known at this time.	If suitable cultural resource properties are found, there is an opportunity for partnership with the recognized tribes in the development of recreational and educational programs for the public.

KEY QUESTION	EXISTING CONDITION	OBJECTIVES	PRIORITY LOCATIONS	OPPORTUNITIES
What are the major recreational uses in the watershed?	Recreational uses include leisure driving, hiking, hunting, dispersed camping, botanical study and wildflower viewing, non-commercial collecting of special forest products, and snow related activities. There are opportunities for both roaded and unroaded recreation experiences. Except for some heavy use of roads during summer holidays, weekends and hunting season, the overall use is estimated to be low to moderate. The Recreation Opportunity Spectrum classification for the western and southern portions of the watershed is Modified. The central and northern portion is Semi-Primitive Non-Motorized, and the eastern edge of the watershed is Semi-Primitive Motorized.	Provide recreational facilities, roads, and trails which meet the needs of the public and are appropriate with other management goals.	FS Roads #3318, 3680, and 1376. Wildhorse Prairie, Huntley Spring and other dispersed campsites. Game Lake Trail (#1169) and Lawson Creek Trail (#1173).	Recreation facilities at Wildhorse Prairie can be improved and access controlled. The two trails need maintenance so recreational use can continue. Develop and provide information to the recreating public on natural feature interpretation, trail opportunities, value of unique habitats, proper camping and day use etiquette. Determine appropriate recreation use of closed roads. Rehabilitate areas that have been damaged. Enforce closures and regulations.

KEY QUESTION: What commodities can be produced from the watershed?

TYPES OF COMMODITY	EXISTING CONDITION	OBJECTIVES	PRIORITY LOCATIONS	OPPORTUNITIES
Timber	Timber harvest has occurred on approximately 3,833 acres since 1955. Most future commercial timber harvest will occur in lands allocated as matrix. Timber harvest can occur in retention and partial retention allocations if visual objectives are met. Timber harvest can also occur in Late-Successional Reserve (LSR) if stand management improves LSR conditions. Timber harvest also may also result under the following conditions: removal of trees that are encroaching on meadows; salvage or sanitation proposals for Port-Orford-cedar; salvage of hazard trees adjacent to open roads; and, salvage if catastrophic events occur.	Manage matrix lands for timber commodities; improve the condition of Late-Successional Reserve (LSR) by accelerating growth and development of early and mid seral stands in the watershed; return meadows to an open and early seral habitat condition; prevent or reduce the spread of *phytophthora lateralis* through sanitation and salvage; reduce public hazards; and, recover commercial value of timber if catastrophic events occur.	Commercial thin 40 to 80 year old stands in LSR to improve late-successional reserve habitat. Commercial thin 40 to 80 year old stands in matrix. Regeneration harvest of stands over 80 years old in matrix.	Initial GIS analysis identified the following acreages available for harvest: commercial thin 148 acres in LSR; commercial thin 554 acres in matrix; and, regeneration harvest of 2799 acres in matrix. Additional analysis would need to be completed to determine if these stands are viable for timber harvest.
Special Forest Products	Special forest products are collected for personal use and on a commercial basis in the watershed. Collection is limited by road access and remoteness to markets. Products include: cedar and fir boughs, Christmas trees, mushrooms, firewood, and beargrass and salal. Impacts on resources have been limited to some localized over-cutting of Port-Orford-cedar boughs. Some special forest products can be collected in Late-Successional Reserve (MA-8) under the Southwest Oregon LSR assessment. There is no collection allowed in Botanical Areas (MA-4).	Meet Forest Plan objectives and standards and guidelines while allowing for collection of special forest products.	Near roads in the watershed.	Collection of cedar and fir boughs, mushrooms, Christmas trees, vine maple, beargrass, salal and firewood.
Mining	Prospecting began in the watershed in the 1850's and continued through the Depression era. During World War II, prospecting for strategic minerals took place in the serpentinite areas of the watershed. In the 1990's the Mindoro corporation surveyed and claimed most of the west half of the watershed and conducted two test drillings in the Wildhorse Ridge area. Today those claims are no longer valid.	Facilitate mineral exploration and development while protecting surface resources and stream quality.	The serpentinite areas in the watershed.	Mining may occur when economic conditions make the operation viable.

KEY QUESTION: What conditions can be produced from the watershed? (continued)

TYPES OF COMMODITY	EXISTING CONDITION	OBJECTIVES	PRIORITY LOCATIONS	OPPORTUNITIES
Grazing	Grazing probably began in the watershed in the 1850's. Morris Fritsche, who had a homestead in the Quosatana watershed, ran a small herd on Wildhorse Prairie prior to and after the Siskiyou National Forest was established. The 1937 Range Management Plan showed Fritsche had a permit to graze two head of cattle on the prairie. Currently there are no allotments in the watershed and none are planned for the future.	Maintain populations of deer and elk. Protect important populations of native grasses. Protect riparian areas.	None.	None.

SOCIAL ASPECTS, continued

KEY QUESTION	EXISTING CONDITION	OBJECTIVES	PRIORITY LOCATIONS	OPPORTUNITIES
Which roads are needed for future access in the watershed and which roads need treatment to protect the resources of the watershed?	Forest Service Roads 3318, 3680 and 1376 provide primary access in the watershed. The remaining roads in the watershed were initially constructed for timber harvest access, but also provide roaded-recreation opportunities. Currently, there are about 60 miles of open road in the watershed. Primary roads: 13 miles. Secondary roads: 29 miles. Candidate for closure: 18 miles. Closed roads (blocked to vehicular traffic but not decommissioned): 6 miles. Decommissioned roads: 8 miles. Under contract for decommissioning: 2 miles.	Determine which roads are needed for future access and which roads need treatment to protect the resources of the watershed.	FS Roads 3318, 3680, 1376 are the primary roads for public and administrative access (13 miles). There are 15 roads classified as secondary roads (29 miles). The remaining roads which have not been decommissioned are candidate to be potentially closed to motorized traffic as need, funding, and priorities allow (18 miles).	The following roads were identified as needing drainage or erosion treatment: 3680.350, 3680.351, 3680.352 and spurs, 3680.402 (portion not decommissioned), and 3680.496. Methods and exact locations of treatment need to be determined. Road 3318 is in need of repair and maintenance.

Key Findings

The Lawson Creek watershed has **significantly higher recorded rainfall amounts** than any other Remote Access Weather Station (RAWS) in the Siskiyou National Forest.

The Lawson Creek mainstem has **warmer than optimum summer stream temperatures**, primarily as a result of natural processes.

The **North Fork Lawson Creek** has changed from its historic condition, and has higher sediment load, less future large wood, increased bank scour, altered channel morphology, and higher summer stream temperatures. Contributing factors are high road density and large clearcuts within the transient snow zone, created prior to the 1964 rain-on-snow event. The North Fork is the highest priority for restoration activities.

Vegetation types in the Lawson watershed are variable due to: its location between the coastal face and drier inland habitats; a wide variation in aspect, soil types, and elevation; and endemic and remnant plant species of the Klamath Province associated with ultramafic soils and isolation from glaciers. **Mixed broadleaf/coniferous forest** is the most common habitat type in the Lawson Creek watershed. **Ultramafic soils** underlay a large part of the eastern half of the drainage and support a wide variety of conifers, including widely-spaced Jeffrey and western white pines on drier upper slopes and Port-Orford-cedar in wet areas.

The watershed has a higher percentage of **late successional forest** (69 percent, about 17,500 acres) than adjacent watersheds such as Quosatana Creek or Pistol River. There are currently greater amounts of late-successional habitat in the watershed then there were in 1940. In addition, future projections indicate that the amount of late-successional habitat is expected to continue to increase.

Early successional habitat, important to deer, elk, and approximately 100 other species, is declining due to meadow encroachment and growth of plantations.

Fire has affected vegetation patterns, especially in the southwestern portion of the drainage, where stands of mid-seral Douglas-fir appear to be heavily influenced by past fires. Two major human-caused fires burned approximately 2500 acres, or 10 percent of the drainage, around 1917.

Timber harvest has also affected the vegetation patterns, mostly as regeneration harvest around the rim and in the lower west side of the watershed. Approximately 15 percent of the watershed (3,800 acres) has been harvested. About 1,000 acres per decade were harvested from 1955-1990.

Since the early 1900's when **fire suppression** became effective in the watershed, the meadows have increasingly become overgrown with conifer tree species. Meadows are projected to continue to decrease in size due to vegetative encroachment and lack of high intensity fire events.

Snow Camp Botanical Area, located in the upper southeast corner of the watershed, contains especially diverse, unique habitats, including Bensoniella populations near the upper meadows and Brewer spruce near Huntley Springs.

Port-Orford-cedar in the Lawson Creek watershed, along with the adjacent Collier Creek and Windy Creek watersheds, are relatively undiseased in comparison to Port-Orford-cedar areas from Coos Bay south to the Rogue River.

Five-needle pine blister rust is severe in the upper southeast corner of the watershed, causing extensive mortality in western white pine due to favorable conditions of summer humidity, recent drought stress, and fire suppression.

Five noxious weed species currently inhabit the watershed and two occur in neighboring watersheds. Overall weed abundance is less than in neighboring watersheds.

The Lawson Creek watershed provides both **roaded and unroaded recreation opportunities.** Primary recreation activities in the watershed include leisure driving, hiking, hunting, dispersed camping, botanical study and wildflower viewing, non-commercial collecting of special forest products, and snow-related activities.

Future **timber harvest opportunities** in the watershed will occur primarily on lands allocated as matrix. There may be some timber harvest to promote the development of late-successional habitat, remove meadow encroachment, sanitation of Port-Orford-cedar, salvage of hazard trees, and salvage if catastrophic events occur. Timber harvest could also occur in partial retention and retention areas if visual objectives are met.

Primary **road access** in the watershed is provided by Forest Service Roads 3318, 3680, and 1376. There are 60 miles of open road in the watershed, 13 miles are primary road, 29 miles are secondary roads, and 18 miles are roads which are candidates for closure. In addition, 6 miles of road are closed to vehicular traffic and 10 miles of road have been decommissioned or are under contract for decommissioning.

AQUATIC ECOSYSTEM NARRATIVE

GEOLOGIC CHARACTERIZATION

Rock Types

The Lawson watershed can be roughly divided into halves, east and west, by rock type, with the mainstem of Lawson Creek and its south fork being the dividing line (See Figure 3, Geology Map). The west half is primarily Colebrooke schist from the southern edge of the basin to Sevenmile Peak. The headwaters of the North Fork are Dothan formation. To the south is a mixture of Colebrooke schist, ultramafic rocks and volcanic rocks. The north consists of sediments interspersed with ultramafic rocks. The east half of the watershed is in large part ultramafic rocks with large areas of Dothan Formation with some Colebrooke schist and volcanic rocks (See Figure 4, Soil Depth and Parent Material Map).

Colebrooke schist usually develops rolling, moderate topography (See Figure 5, Slope Classes Map). Slopes tend to form benches due to differential weathering. Soils in Colebrooke Schist are generally deep on moderate slopes, thin to medium on ridgetops, and thin and rocky in steeper inner gorges and tributary headwalls. The schist can be subject to deep failure when oversteepened (Ferraro, 1990).

Ultramafic rocks consist mainly of serpentinite with some related rocks (peridotites, dunites and gabbros). Landslides are prevalent in sheared serpentinites. Inner gorges are active, with numerous small and large slides, and continuous soil creep and ravel. Stream channels in serpeninite are often choked with slide debris (Ferraro, 1990).

Areas of ultramafic rock can weather to form low slopes. Frequently these areas are sparsely vegetated due to the toxicity of soils formed by ultramafics. Ultramafic soils can be high in amounts of chromium, nickel and cadmium and low in calcium. This can form distinctive plant associations with cedar, coffeeberry and azalea being commonly found. Soils are red or gray in color and can be unstable and erodible when disturbed.

Dothan formation rocks consist of clay-rich sandstone, siltstones, mudstones and minor amounts of chert. Landslides within the dothan tend to be concentrated in inner gorges and adjacent sideslopes in major creeks and tributaries, due to oversteepening (Ferraro, 1990). In other locations on the forest, landslides in Dothan rocks tend to be slump earthflows and debris torrents.

Areas of volcanic rocks tend to be stable but are prone to ravel. These rocks tend to be resistant to erosion and commonly form topographic highs. Soils on volcanic rocks are typically shallow.

Faults

The Lawson watershed contains high angle (near vertical) and low angle (thrust) faults. High angle faults are areas of near vertical movement, which creates shear zones which may be a few tens of feet to a few hundred feet wide. Low angle faults are areas where movement between rock may be more horizontal and may contain shear zones of hundreds of feet to a mile wide.

Faults commonly act as contacts between different rock bodies and may act as conduits for water, forming springs or seeps.

GEOMORPHOLOGY

The geology of the watershed is responsible for the physical expression of different landforms. Faults can form high cliffs or stream courses depending on the type and extent of movement.

Landslides have been active in forming the landscapes within the watershed. Huge landslides have blocked the mainstem and created areas of deposition, forming large flats.

Figure 3

LAWSON WATERSHED GEOLOGY

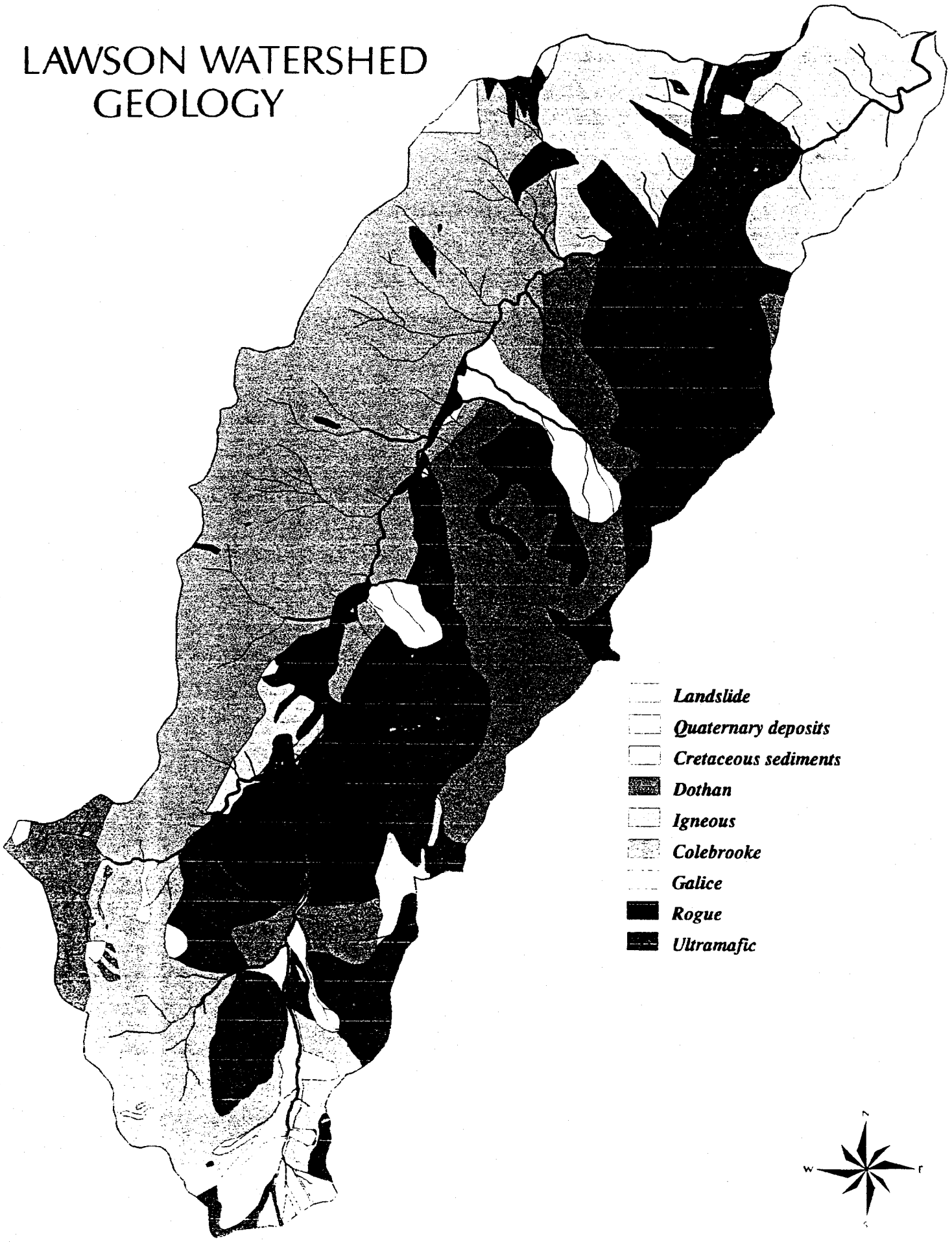


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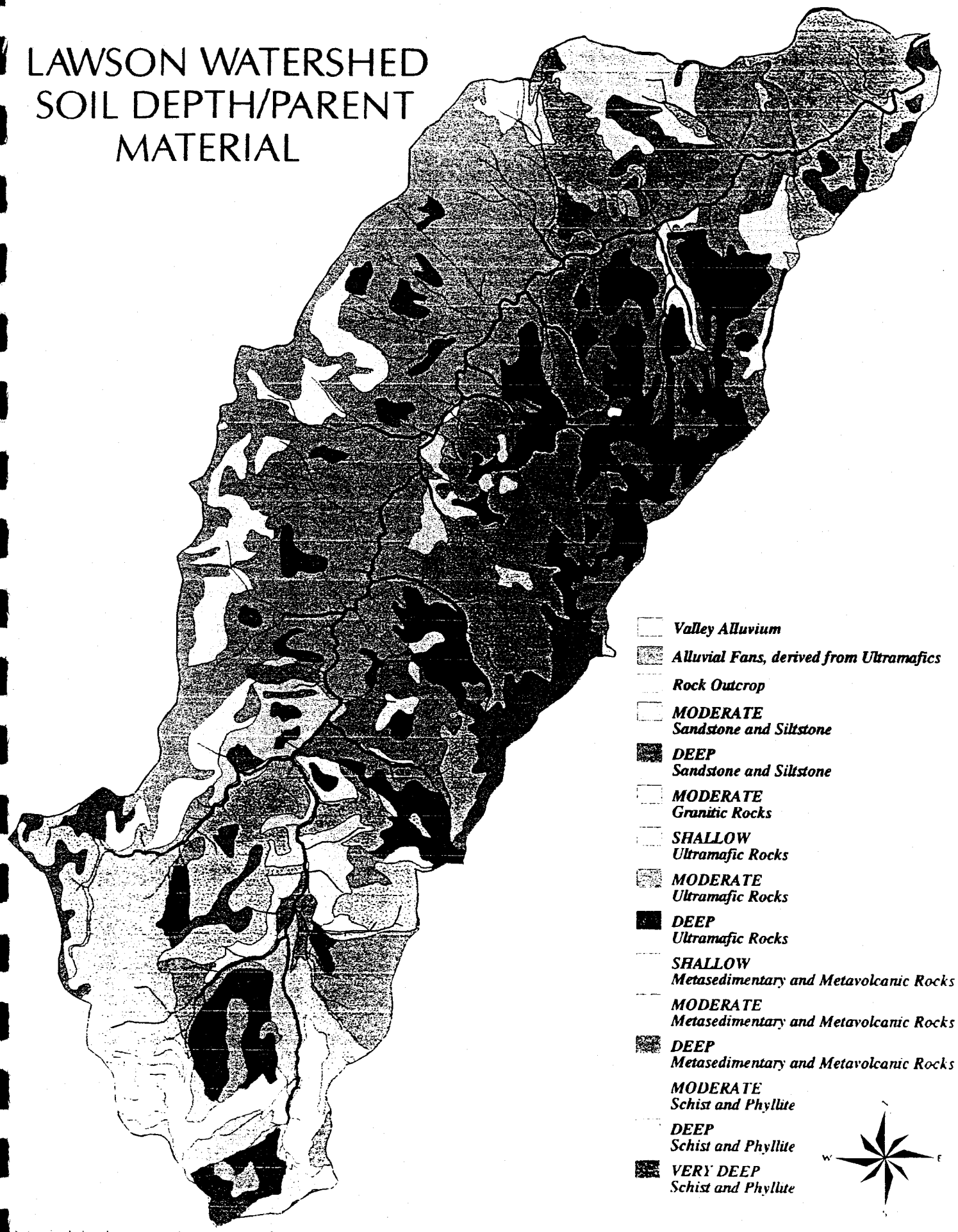
Figure 4

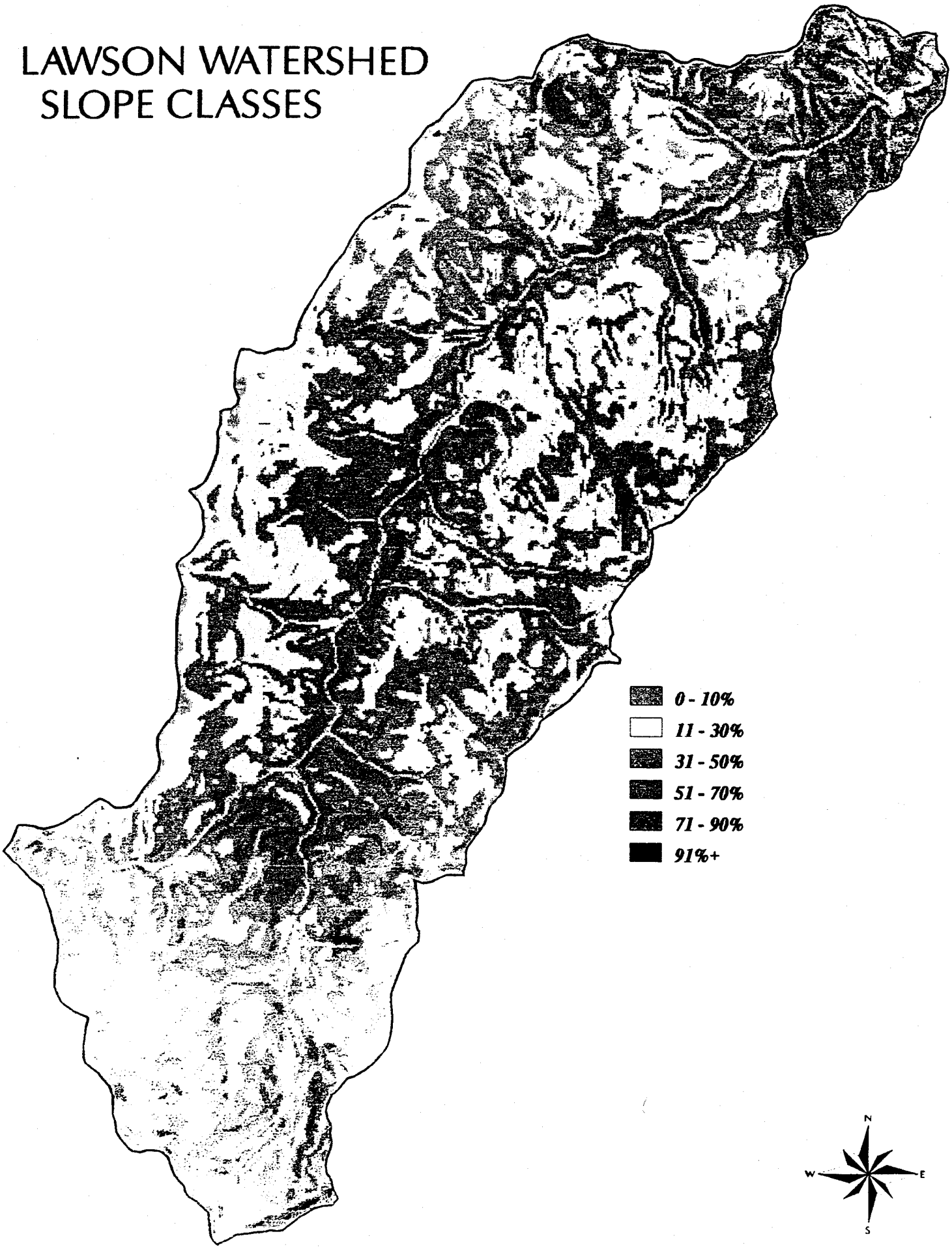
LAWSON WATERSHED SOIL DEPTH/PARENT MATERIAL



NOTE: Soil depth is a weighted average for all soil series in each soil mapping unit.
Mapping for Curry County by USDA Natural Resources Conservation Service.

Figure 5

LAWSON WATERSHED SLOPE CLASSES



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What erosion processes are dominant within the watershed?

Natural Processes

Landsliding and erosion are natural processes that deliver sediment to streams. Landsliding, the downslope movement of rock and soil, occurs when forces such as gravity and pore pressure exceed the shear strength of soils. Shear strength can be affected when slopes are over steepened or when components which contribute to shear strength are decreased (such as decay of tree roots). Reduced shear strength can be the result of natural processes such as fire, erosion, earthquakes and disease. Sediment delivery to streams can affect fish habitat and stream morphology.

Landslides occur in the Lawson watershed as ravel, debris flows, and slump earthflows. Ravel is the surface erosion of soils and in some cases rock. Typically within Lawson this occurs where Lawson Creek erodes the toe of the landslides in serpentinite areas. The continued surface erosion makes it difficult for vegetation to become established and results in barren areas. Areas of ravel are common along the lower mainstem of Lawson creek.

Debris flows, which often originate in steep headwall areas, can travel downslope for long distances and entrain significant volumes of wood and coarse sediment. They are mass failures that have high energy and have the ability to scour streams to bedrock and deposit large volumes of sediment in low gradient stream sections. Debris flows are linear features and do not affect large areas, but can have significant effects on streams and their morphology.

Slump-earthflows are downslope movements of soil and rock which can include large areas. Typically these are deep seated features associated with thick soils. These flows have a profound effect on topography. Large curved valleys with steep hillsides are formed by the downslope movement of the earth and rock. The deposits form areas of low slope and rolling topography, and can flow into streams causing diversions or blockages. When breached, these earthflow dams may release large volumes of water and sediment downstream. This can have a tremendous amount of energy available to scour channels, affecting stream channel morphology.

Inspection of 1940 aerial photos shows relatively little landslide activity. Large active landslides are observed in the mainstem of Lawson creek with some active landslides along larger tributaries and relatively little activity in the upland areas. The landforms of many large ancient slump earthflows are visible (one is estimated as having a total volume of 17.4 million cubic yards, Henkle 1990). The bodies of these large mass failures appear inactive given the amount of vegetation on them (in some cases this includes old growth). Areas near the bases of these landslides continue to erode due to fluvial processes.

A number of these ancient and recent large landslides have affected the course of Lawson Creek. Large volumes of rock and soil moved downslope and were deposited in the channel, diverting the stream flow and in some cases damming the creek. Diversion of the creek from one side of the channel to the other creates new areas of erosion where once stable toe slopes are again eroded, resulting in more mass failures. The damming of the creek creates areas of low energy and gradient resulting in the deposition of sediment. These areas of deposition fill the channel creating large gravel bars. Below the damming, gradient increases, as does the ability of the stream to erode and transport sediment. This often erodes more toe slopes down stream and may result in increased landslide frequencies.

The two most obvious locations where slump earthflows have altered stream channels are along the mainstem and in the North Fork. A profile of the mainstem of Lawson Creek shows an irregular gradient near the middle of an otherwise typical curve (see Figure 6, Lawson Creek Profiles). A prehistoric landslide flowed into Lawson Creek in section 16, approximately 7 miles from the mouth. The landslide was approximately 17 million cubic yards in size. It dammed Lawson Creek and formed an area of deposition behind it, creating a flat approximately 4 acres in size. When the landslide inundated Lawson Creek, evidence appears to indicate that a debris flow was created which flowed downstream to stream mile 4.2, where large boulders in the stream channel (indicating the terminus of the debris flow) have created a cascade that is impassable for salmon.

The stream profile of the North Fork of Lawson Creek shows that the gradient differs from what might be expected. There is a long, relatively low gradient segment high in the watershed, between stream miles 2 and 3. This seems to be a result of a landslide deposit at stream mile 2, which blocked the stream in prehistoric times. Total volume of the landslide is estimated at 1.3 million cubic yards. The deposit acted as a dam decreasing the stream gradient above and creating areas of deposition. This may be an explanation for the relatively broad, flat valley floor in the upper reaches of the North Fork and its primary tributaries. On the downstream side of the landslide, gradients increase to 15 to 20 percent. The landslide appears to influence the gradient of the stream for at least a mile, to stream mile 1 where gradients drop to about 8 percent. The low gradient and broad stream valley made the upper North Fork particularly vulnerable to the sediment delivered by tractor logging in the 1950's.

Human activities affecting erosion processes

The first significant alteration of the landscape by man occurred in 1956 when three large clear cuts totalling nearly 400 acres were harvested in the North Fork drainage. These units were tractor logged using practices of the time. Skid roads were closely spaced, roads were built in and adjacent to streams, and fill slopes were probably poorly compacted. There was little consideration for runoff diversion and few, if any, structures were considered other than low standard stream crossings using logs and earth fill.

Logging and road construction with these practices continued in the North Fork through the 1960's. Aerial photos show that these areas which were tractor logged in the 1950's and 1960's had numerous fill failures, runoff diversions, and erosion causing large volumes of sediment and woody material to be delivered to streams. With the low gradient and low flow of the North Fork, the stream had little capacity to transport the influx of sediment, and aggradation resulted.

Later aerial photo flights show continued logging and road construction in the watershed. Improved logging practices appear to have resulted in landslide rates that are near natural in harvested units. Roads continue to have a greater effect on landslide rates than harvest has, although improved road design has lowered these rates also. The effects from sediment delivery from logging appear to be localized within the North Fork, where gradients and flows are low and streams are adjacent or directly downstream from road construction and timber harvest.

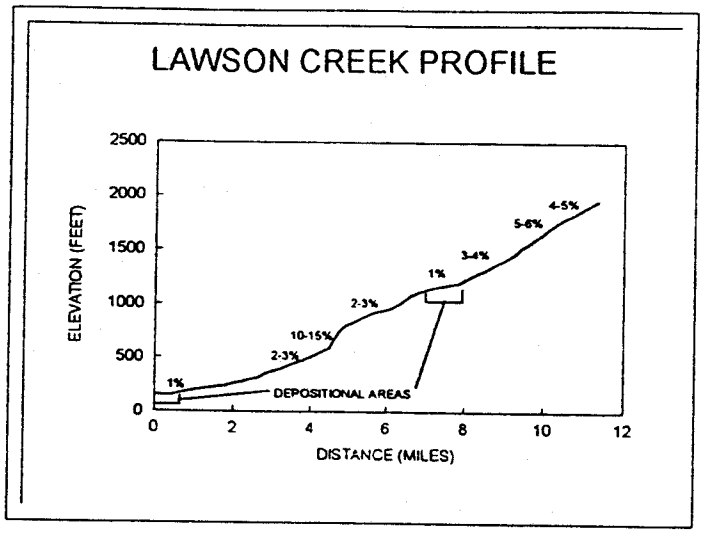
The number of landslides on the mainstem and its tributaries increased between 1964 and 1969. It is unlikely that this is due to timber harvest and road construction, which created effects that were confined to the North Fork. It is more probable that this was the result of the 1964 flood (100-year event). These high flows caused toe slopes of existing slump earthflows to erode, increasing the size of existing landslides and creating new landslides. For more discussion of the effects of this flood event, see Channel Morphology and Water Quality sections.

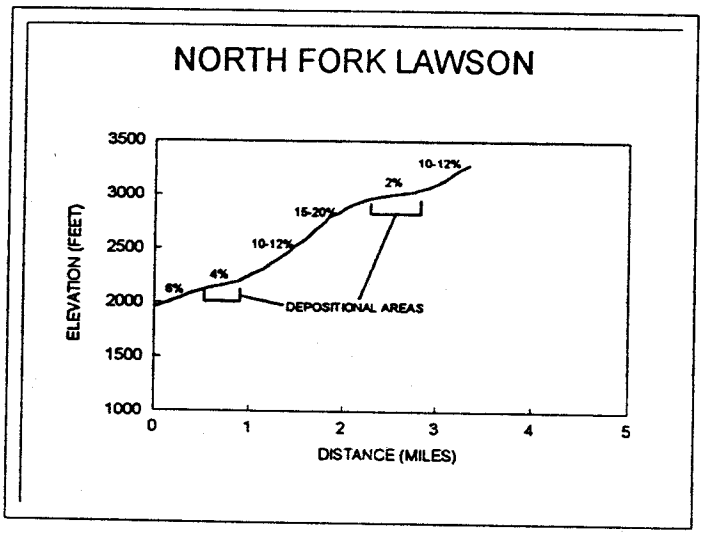
Eight miles of road have been decommissioned and two more miles are under contract for decommissioning. Ten miles of road have been treated or "stormproofed" to improve drainage. Decommissioning of roads should return road segments to near natural drainage patterns. It removes stream crossing fills which could cause debris flows in streams. These ongoing treatments reduce the long-term risk of sediment delivery to streams from roads. Short-term increases in sediment from decommissioning activities would be too small to be measured in the mainstem.

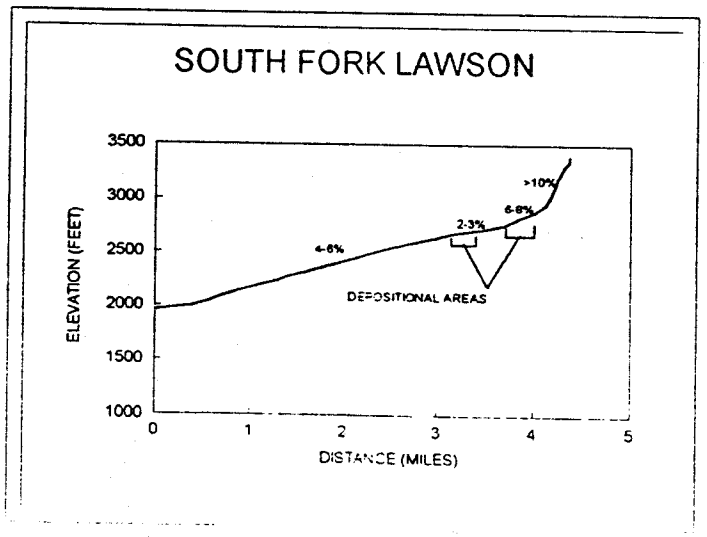
Information Needs: Survey areas to determine potential sediment delivery to streams. These include harvest units in the North Fork and South Fork drainages and natural-caused landslides along the mainstem. Assess the extent of potential water diversions caused by roads that may be occurring in the watershed. Assess the effects of recent flooding on landslide and sediment delivery rates.

Management Opportunities: Complete road repair projects to decrease the amount of sediment delivery to streams, runoff diversion, and erosion from the existing road system. Decommission roads that are abandoned, currently undriveable, or not needed for future management.

Figure 6, Lawson Creek Profiles







What are the dominant hydrologic characteristics and processes in the watershed?

The Lawson watershed receives an average of 115 inches of precipitation per year, with a range from 90 inches near the mouth at Oak Flat to 130 inches in the upper third of the watershed, south of the confluence of the forks (State of Oregon Isohyetal Maps). The Remote Automated Weather Station (RAWS) near the South Fork Lawson Creek consistently records rainfall amounts roughly double the amounts at other RAWS sites on the westside of the Siskiyou National Forest. During a November, 1996 storm 24 inches of rain were recorded in a 48 hour period.

Fifty-three percent of the watershed is in the transient snow zone, with an additional 1 percent in the snowpack zone. The heavy precipitation and concentrating effects of snowmelt contribute to high winter streamflows (see Figure 7, Elevation Zones Map).

Lawson Creek does not have a streamflow gage. A summer flow of 19.5 cubic feet per second was measured in September, 1993 near the mouth. This is 0.5 cubic feet per second per square mile of watershed, which is about average for Siskiyou coastal stream low flows.

Major flood events occurred in 1955 and 1964. Effects of these, plus the 1972 storm event, are discussed in the channel morphology section.

Aspects of streamflow that have the greatest effect on aquatic habitat are peakflows which affect channel morphology and fish, low flows which restrict migration and reduce available habitat, and the size and frequency of channel-forming events. All of these may be affected by timber harvest and road construction.

The potential for effects from peak flows are the greatest in areas where road density is highest and stream banks are unstable. Roads surfaces and cutslopes intercept water, and road ditches act as intermittent streams, expanding the channel network and transporting water more rapidly than natural processes. Current research has only identified this problem and has not developed accurate methods for estimating its effects. While other factors such as road location and stream crossings are important considerations, road density can be used as a rough indicator of potential problem areas by correlating road density with observed effects.

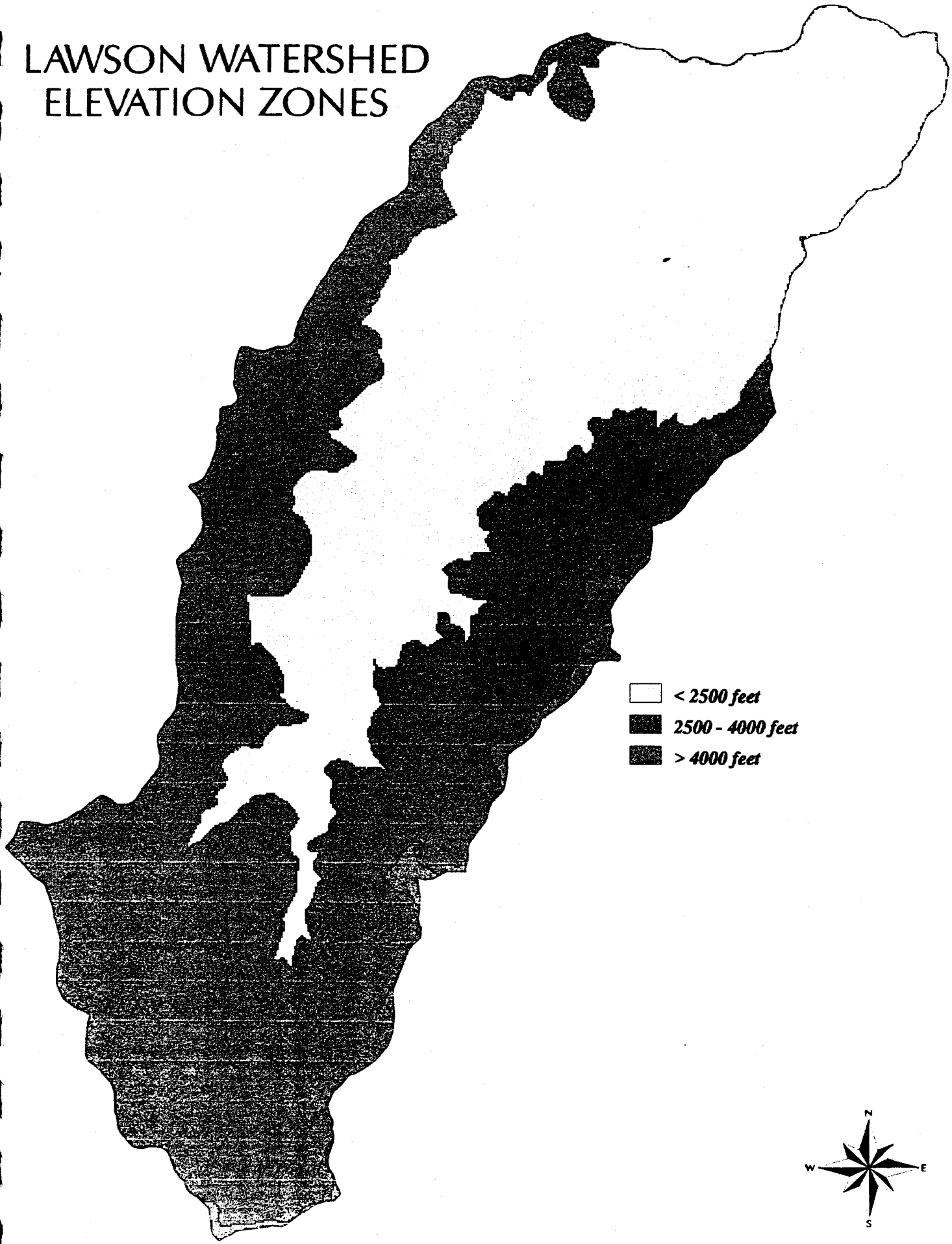
The watershed has an overall road density of 1.9 miles per square mile. This is considered low and probably has little or no effect on increasing peak flows. The road densities are higher in some Watershed Analysis Areas (WAAs) (See Table 1 and Figure 8, WAAs Map). Road densities greater than 4.0 miles per square mile are considered to be high enough to affect peak flows.

Smaller tributaries may be affected even where road densities are low. On several intermittent streams within the Lawson watershed, the channels are downcut and scoured below road crossings, and stable above. This suggests that water concentrated in the ditchline adjacent to these streams may significantly increase local peak flows.

Timber harvest, especially with tractor yarding, can compact the soil and have an effect similar to that of roads. Harvest in the transient snow zone increases snowpack by changing wind currents and decreasing canopy interception, both of which deposit more snow on the ground. More snow is available to be melted during rain-on-snow-events, which can increase peak flows. Over half of the Lawson watershed is in the transient snow zone. Of that 12 percent has been harvested. The area of greatest concern is the North Fork subwatershed, 90 percent of which is in the transient snow zone. Forty-two percent of this area has been harvested. During the decade prior to the 1964 rain-on-snow-event, 560 acres were harvested with extensive roading and tractor yarding. This harvest may have contributed to the size of the flood in that subwatershed.

Figure 7

LAWSON WATERSHED ELEVATION ZONES



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The following table lists the WAAs by number, the road density in miles of road per square mile of area, and the percent of the transient snow zone within that WAA that has been harvested. The greatest likelihood of effects is in the highlighted WAAs, where both road densities and transient snow zone harvest are high. (See Figure 8, Watershed Analysis Areas Map.)

Table 2. Road Density and Percent Harvested in Transient Snow Zone.

		Percent Harvested within Transient Snow Zone	
WAA	*Road Density*	*1955 to 1974*	*1975 to 1996*
07L01F	0.55	–	–
07L02W	0.76	–	–
07L06W	3.50	2	–
07LO7F	0.12	–	–
07L08W	2.61	22	3
07L09W	**4.11 Wildhorse**	**10**	**24**
07L10W	**4.28 Wildhorse**	**–**	**20**
07L11W	2.90	–	6
07L12W	0.70	1	2
07L14W	1.60	13	8
07L15W	2.83	19	7
07L16F	0.29	–	–
07L17W	**4.04 N.Fork**	**27**	**15**
07L18W	2.55	20	8
07L19W	2.42	12	8
07L20W	3.80	10	–

Any increases in peak flows from harvest units is expected to decrease as the trees continue to mature in size. As roads are decommissioned and revegetate, peak flows may decrease in tributary streams.

Management Opportunities: Decommission roads and return the natural drainage pattern in high density subwatersheds.

What are the basic morphologic characteristics of stream valleys and channels and the sediment transport and deposition processes in the watershed?

The mainstem of Lawson Creek, from the confluence of the North and South Forks downstream 11 miles to the mouth, lies within a steep inner gorge. Numerous large slides line this inner gorge, delivering large amounts of coarse and fine sediment to the channel. Much of the mainstem streambed is bedrock, large boulders, and cobbles.

The gradient of the mainstem has a typical curved profile, 4 to 5 percent gradient at the forks confluence, decreasing to 1 percent at the mouth, with an atypical bulge in the middle. This bulge is in the vicinity of a large earthflow, and may be the result of material moving downslope through geologic time (see Geology section). At the upstream end of the bulge is a flat with 1 percent gradient, where cobble-sized sediment is deposited; at the downstream end is a 10 to 15 percent gradient cascade, where all but large boulders are transported. (See Figure 6, Lawson Creek Profiles)

The South Fork Lawson Creek has the larger drainage area of the two forks, with higher streamflow. The channel is confined. Its profile shows a fairly constant average gradient of 6 percent over the lower 3.5 miles, steepening to over 10 percent only in the uppermost mile of its headwaters. This relatively steep and constant gradient, combined with high streamflow, make most of this fork a transport stream. Two segments between mile 3 and mile 4 show the aggradation characteristic of depositional reaches. One segment is a 2 to 3 percent segment while the other is a steeper segment with less flow and heavy natural tributary sediment delivery.

The upper South Fork channel has pool riffle morphology, with material ranging in size from small boulders and cobbles to gravels and sands. Slides and sparse riparian vegetation are found in the serpentine areas. The lower half of the South Fork flows through a steep bedrock and boulder canyon.

The North Fork has a smaller drainage area and less flow. Its profile undulates, with a 10 to 12 percent headwaters gradient flattening to 2 percent in the upper third of its length. This upper segment flows through a somewhat open valley (see Geology section). The middle third of the North Fork flows through a steep inner gorge, with a stream gradient of 10 to 20 percent. The lower third flattens to 4 to 6 percent. The upper segment with its relatively flat gradient and lower flow is particularly subject to deposition. A 4 percent gradient segment in the lower third, just below the steep middle third, is also subject to deposition.

In 1940, prior to timber harvest and roading, and without any major storms in prior decades, large slides were prevalent along the mainstem and tributaries. The slides were located primarily in the many serpentine areas along the stream. Deposits containing large boulders are visible in aerial photos taken at that time. Similar deposits with large boulders are in the channel below the slides today. Many of the smaller cobbles, gravels and sands have been transported downstream or out of the system. The high precipitation and resulting high stream flow in Lawson result in high sediment transport capability, making Lawson a very dynamic system.

Effects of Storm Events

The 1955 storm was the first major storm to hit the southern Oregon coast in decades. Logging activities still had not occurred in the watershed. Surprisingly, Lawson showed few effects when compared to other watersheds up and down the coast such as Little Redwood in Northern California, Shasta Costa, a neighboring watershed, and Elk River near Port Orford. While other watersheds lost most of their riparian vegetation including large conifers, Lawson only lost the smaller trees and shrubs. Increases in stream bank slides were minimal, even in the serpentine areas.

The 1964 storm, a 100-year event, delivered heavy rains and caused rapid snow melt. The storm caused widespread impacts to higher elevation watersheds, but did little damage over what had already occurred in 1955 to the lower coastal watersheds. This may be because coastal watersheds have little area in the snow zone. Again, Lawson responded differently than neighboring watersheds. Over half of the watershed is in the transient snow zone. Evidence would suggest that the full effects of the 1964 rain on snow event were experienced in the Lawson watershed. Existing slides grew in size and numerous new ones appeared. Vegetation that had been spared by the 1955 storm was lost. New gravel bars were created and the channel aggraded below the new slides.

The most significant damage to the stream channel occurred in the North Fork. In the 1940s, the North Fork had stable stream banks, riparian areas well vegetated with mature and old growth conifers, and a stream channel that was most likely well stocked with the large wood that is typical of a small forested stream.

By the early 1960's, large areas of the North Fork had been logged and heavily impacted by tractor harvest methods and poorly built roads. Sediment and debris from the logging activities completely filled in the channel in the upper depositional reaches. Storm flows cut deep gullies where the ground was bare from clear cutting, and tractor logging trails diverted and concentrated surface water. Subsequent road construction and harvest with stream cleanout in the steeper headwaters in the 1970's and 1980's caused channel downcutting, and added more sediment to the aggraded lower sections.

The sediment loading in the Lawson Creek mainstem channel following the 1964 storm came from increased activity in the numerous mainstem inner gorge slides, and large slides located on the steep gradient smaller tributaries. The large amounts of sediment delivered to the North Fork probably had little or no effect on the mainstem. The combination of log jams storing sediment and lack of sufficient stream energy in the North Fork to move sediment buffered the effects to the mainstem.

Storms in 1955 and 1964 had little effect on the South Fork Lawson. Earliest photos (1940) show some aggraded sections and landslides on both the South Fork and its tributaries. A few additional open reaches appear following the 1955 and 1964 storms. The high sediment transport capability of most of this fork allows it to move any gravel-sized incoming sediment.

In the early 1970's timber harvest and road construction began in the upper reaches of the South Fork. The activities were typical of that time, with large clear cuts, inadequate riparian protection, and poor road construction practices. The 1972 storm had the greatest effect in the South Fork drainage. It triggered many gullies and small landslides in the new harvest units, as well as the larger landslide that blocked Road 3680.402. All of these delivered sediment to the upper tributaries and subsequently to the South Fork, adding to the natural aggradation in the upper reaches. The lower half shows little effect, because of its high transport capability.

Comparison of Historical and Current Conditions

The channel of the Lawson Creek mainstem today is probably similar to how it was in 1940 and before. Some pools that existed in 1940 may be filled in from recent slides, but pools that were filled in 1940 may have reformed as sediment is transported out. Lawson is truly a dynamic system that has the stream power to manage large amounts of sediment from natural slides.

The North Fork has changed significantly as the result of timber harvest and roading. Today, after forty years, flatter gradient segments of the North Fork and its tributaries are filled with sediment. The streams are cutting channels through the deposits, but many areas have subsurface flow in summer. One small, intermittent tributary that was used as a tractor skid road in the 1950's is now a gully up to 10 feet deep. The 2 percent gradient area of the North Fork, which was once a typical forested stream, now meanders through an open meadow-like alluvial valley, and in summer is a series of still pools. Riparian vegetation is returning slowly.

The upper South Fork has aggraded sections, most predating management activities. The combination of topographic benches along the upper reaches, and powerful streamflow in the lower reaches prevented lasting effects from the 1972 storm and management activities.

Other impacts to stream channels from human activities are small and scattered throughout the upper portions of the basin. These impacts are primarily channel downcutting and bank sloughing in small tributaries below road culverts. Most of these areas have stabilized. A more serious problem is culvert plugging where fills are washed away causing debris flows in downstream channels. The 1972 storm triggered two of these near the end of Road 3318.310.

Future Conditions

In the future, the mainstem will continue to function as a dynamic system with the stream power to manage high levels of natural sediment loading.

The North Fork will continue a slow recovery over the next few decades. Insufficient flow to transport large amounts of sediment, multiple log jams, and continued sediment sources delay recovery. If road maintenance continues to decline without decommissioning unmaintained roads, channel recovery on the North Fork could stop and conditions could further decline. The North Fork drainage is the highest priority for restoration activities.

The tributaries of the South Fork will continue to recover over the next several decades. However, if road maintenance continues to decrease without decommissioning unmaintained roads, sediment delivery could increase causing channel recovery to stop and conditions could again decline.

At this time, all stream segments surveyed within the Lawson drainage have ample large wood, except the mainstem. The stream power discussed earlier washes most large wood out of Lawson Creek.

Timber harvest has reduced the amount of large wood that will be available to some tributaries in the future. Acres harvested within likely landslide delivery distances of channels, and miles of harvest along streams were examined. There were similar findings with harvest having occurred on an estimated 2 percent of the mainstem and its tributaries; 16 percent of the South Fork and its tributaries; and 51 percent of the North Fork and its tributaries have been harvested. This suggests that the North Fork may be seriously depleted in future large wood supply until trees in harvested areas mature.

Management Opportunities: Restore sections of the North Fork that are failing to show signs of recovery. Restoration would include stabilizing stream banks, removing sediment and constructing a natural pool riffle sequence.

Stabilize an intermittent stream that crosses the 3318.310 road and enters the North Fork. An old clear cut increased the stream flow, tractor yarding straightened the channel, and the channel is continuing to downcut, delivering sediment to the North Fork.

Plant and release conifers along the North Fork and its tributaries to improve future large wood supply in riparian areas where conifer stocking is low.

What beneficial uses dependent on aquatic resources occur in the watershed? Which water quality parameters are critical to these uses?

The primary beneficial use is the anadromous fishery. Two residences are located on private property within the watershed, but there are no water withdrawal rights on Lawson Creek. The mouth of Lawson Creek is near Oak Flat, a popular recreation spot near the mouth of the Illinois River for camping, fishing, and swimming. Some recreationists cross the river to explore the mouth of Lawson. The critical parameter is stream temperature for anadromous fish, with some concern for turbidity.

Turbidity

Lawson Creek, like most streams in the area, has little turbidity except during winter storm events. The stream does not seem to have greater or longer lasting turbidity than other streams. Active inner gorge landslides contribute both coarse and fine sediments. The active toes of ultramafic slump-earthflows contribute more fine, clay-sized material than other soils in the basin, and therefore contribute more to turbidity. Human activities have not had lasting effects on turbidity in the basin.

Temperature

Stream temperature is a function of several factors including solar intensity, climate, streamflow, and the amount of stream surface area exposed to solar radiation. The latter is determined by channel morphology and vegetative and topographic shade. Fires, large storms, and human activities such as timber harvest and road construction have the potential to influence stream temperature by altering channel shapes and the amount of shade-producing vegetation.

Historical stream temperature records are not available prior to 1989. The effects of changes observed in some of these factors on historical aerial photos were modelled using SHADOW, to estimate resulting stream temperatures in degrees Fahrenheit. The South and North Fork were modelled at their confluence with the mainstem. The mainstem was modelled at Section 16, located midway in the watershed. This area is below where management activities occurred, and is closer to the forks than the mouth is, making this location more sensitive in detecting changes in stream temperature. (See Figure 9, Stream shade and temperature modelled in SHADOW.)

Historical Conditions

On the 1940 aerial photos, the quality of stream shade varied on the mainstem. At that time no human activities had altered stream shade in the watershed. Approximately 60 percent of the mainstem was well vegetated and well shaded by large conifers and some hardwoods. The remaining 40 percent had moderate to sparse vegetation, many on serpentinite slopes. There were numerous streambank slides, some a mile long. Most of the South Fork and the lower portion of the North Fork were sparsely vegetated with small trees. Much of the watershed is strikingly sparse in vegetation, probably as a result of large scale intense fires in the late 1800's.

Modelling estimates that the peak summer stream temperature at Section 16 on the mainstem reached 66 degrees Fahrenheit (F), with an average shade value of 85 percent. The South Fork had 62 degrees F with 85 percent shade; the North Fork had 57 degrees F with 92 percent shade.

In the 1957 and 1964 photos, vegetation is noticeably larger, and few effects of the 1955 flood are seen in the channels and riparian areas of the mainstem and both forks. On the 1964 photos, several large clearcuts with a dense network of roads and tractor skid trails can be seen in the upper end of the North Fork. All riparian vegetation within these harvest units was removed. Piles of logs were used as stream crossings, and some stream channels were used as yarding corridors, simplifying channel structure and reducing structural shade.

The 1969 photos show the effects of the December, 1964 storm. The most noticeable change in shade on the mainstem of Lawson Creek was in the serpentine areas. The slides grew in size and number and the small amount of stream shade that had been provided by the sparse vegetation was lost. In many places along the mainstem high flows removed patches of conifers and hardwoods from gravel bars and stream banks. In several low gradient areas, sediment from the slides was deposited filling in the stream channel and causing it to widen, taking out further riparian vegetation.

The North Fork shows extensive damage. Gullies extend from units into channels, and channels are clogged with logging debris and sediment. These changes made channels wider and shallower, exposing more surface area to solar radiation. Riparian vegetation recovery was set back. It is estimated that these changes reduced stream shade to 78 percent, resulting in an increase in stream temperature of 4 degrees F above 1940 temperatures.

The South Fork shows little change until the 1973 photos. In the South Fork, most of the harvest and road construction took place between 1969 and 1973. Clearcuts extended across tributary channels with no riparian buffers. During the storm event of 1972-73 road and yarding corridors concentrated water, contributing to numerous gullies and one large landslide. Sediment from these aggraded some channel segments and removed some riparian vegetation. Effects to the South Fork were far less than those to the North Fork a decade earlier. Harvest and road building practices had improved, a smaller percentage of the drainage area was harvested, and the storm event immediately following harvest was smaller.

Subsequent aerial photos show the progression of harvest and road construction through the Lawson drainage, with some clearcut harvest of riparian areas along small tributaries. Additionally, extensive harvest of live Port-Orford-cedar from the South Fork riparian areas began in 1970 by helicopter, and continued uwith salvage logging of disease-killed cedar until 1990.

Unlike the North Fork, the South Fork experienced a cooling trend as fire-damaged riparian vegetation recovered and fire suppression prevented further fires in riparian areas. The taller conifers improved stream shade on the wider South Fork mainstem. Logging in the 1970's offset this recovery, keeping summer peak temperatures at the 1940 level of an estimated 62 degrees F.

No harvest of shading vegetation has occurred along the south bank of the mainstem of Lawson Creek. The mainstem also experienced a cooling trend since 1940 as fire-damaged riparian vegetation recovered. Because of the small flows of the North Fork during the summer, the sharp increase in stream temperature from logging had no measurable effect on the mainstem of Lawson (as estimated from modelling). Section 16 showed a 1 degree F cooling since 1940.

Vegetation age and size were estimated on the 1940 photos and mapped in GIS. The ages within Riparian Reserves in 1940 were compared to present ages. The net effect of the combination of vegetation growth and

timber harvest within Riparian Reserves is an increase in mature and old growth of 1308 acres, from 54 percent of Riparian Reserve acres in 1940 to 75 percent in 1986. (This does not take into account vegetation decreases through landslides or changes in channel morphology.) This increase in mapped riparian vegetation age correlates with changes observed on aerial photos and modelled in SHADOW.

Present Conditions and Trends

Today, summer stream temperatures in the lower seven miles of Lawson Creek are warmer than optimum for salmonids (see Fish Rearing Habitat). Measured summer stream temperatures at the mouth range from 67 degrees F to 73 degrees F. (See Table 3, Average 7-Day Maximum Stream Temperatures). The mainstem has both topographic and vegetative shading from the confluence of the North and South Forks to the large flat in Section 16 (near mile 7.3). The geologically created open flat, followed by active inner gorge landslides along much of the mainstem below this area, contribute to the natural heating. It is estimated that the mainstem temperature has cooled 2 degrees F since 1940 from the growth of fire-damaged riparian vegetation and fire suppression.

On the North Fork, some of the riparian area has grown back in hardwoods, and conifers shade segments of tributaries within the 35 to 40 year-old plantations. The shorter hardwoods and immature conifers provide adequate stream shade for the small North Fork channel. However, most of the low gradient portion of the upper North Fork where the channel structure was changed remains exposed to the sun. The stream temperature is elevated and estimated 1 degree F above 1940, with 4 percent less stream shade. The temperature is expected to return to the 1940 level as the upper reaches continue to recover.

Factors contributing to the South Fork temperature being higher than the North Fork are the length of perennial stream -- the South Fork has nearly double the miles of perennial stream available to collect warming influences -- and the sparsely vegetated canyon on the lower 1.5 miles of the South Fork. The South Fork temperature is an estimated 1 degrees F cooler than it was in 1940 and is expected to remain stable and within the natural range of variability.

Table 3. Average 7-day Maximum Stream Temperatures, degrees Fahrenheit

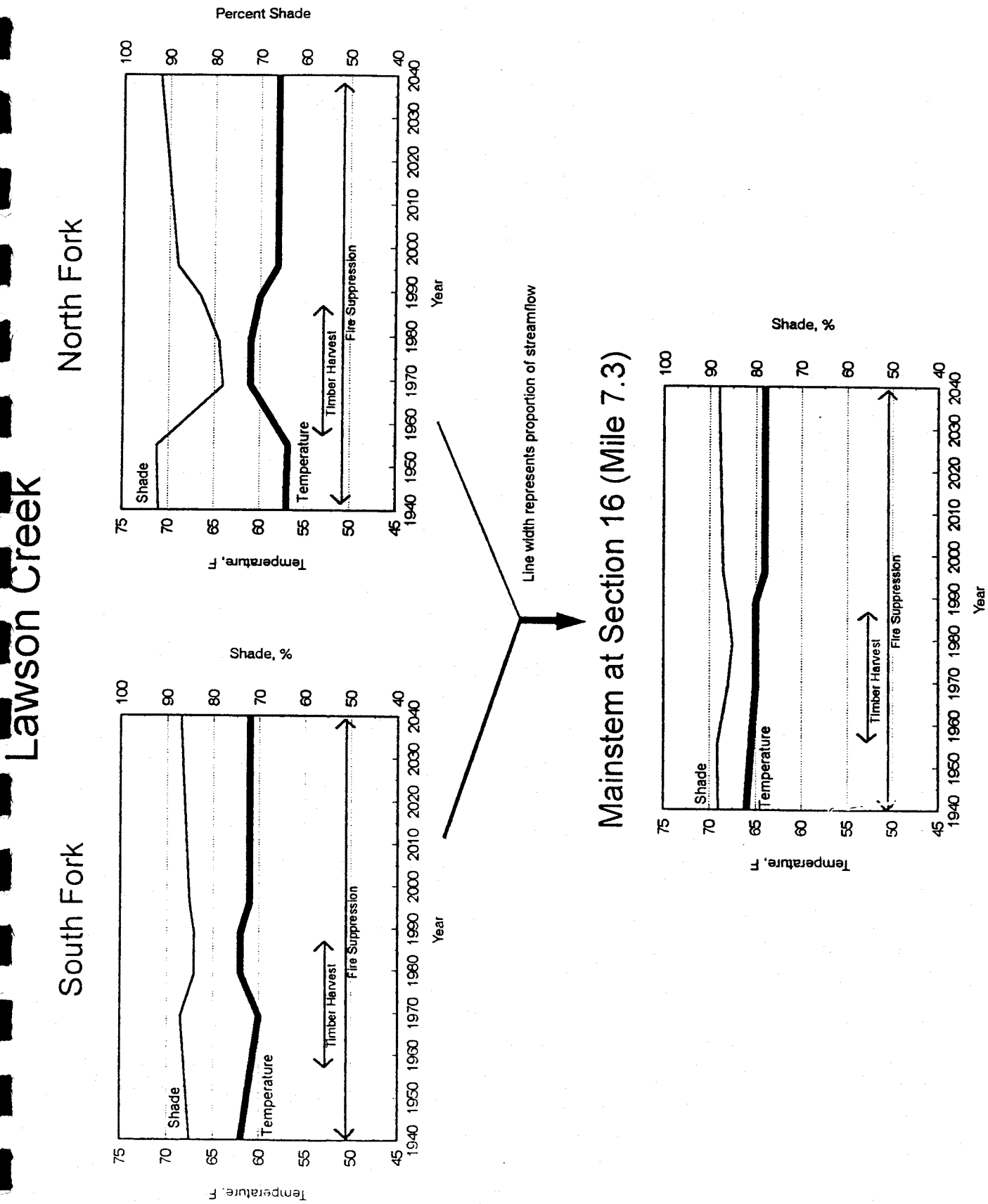
Site	Mile	1989	1990	1991	1992	1993	1994	1995	1996
North Fork mouth	11.3						57.9	57.1	
South Fork mouth	11.3						62.8	60.2	
Section 16	7.3		65.0	63.4	64.2	61.9	62.9	62.9	63.1
Trail	4.3							64.2	
Reach 3	2.0						69.1		
Reach 2	1.3						69.9		
Mouth	0.3	67.5	71.5	70.6	72.5	67.2	69.7	68.8	69.7

Some observations on these results of temperature monitoring:

- 1993, which had the coolest temperature at the mouth, also had the least warming in the lower 7 miles.
- 1992, which had the warmest temperature at the mouth, also had the greatest warming in the lower 7 miles.
- These 1992 and 1993 data illustrate the role of the inner gorge landslides in the lower 7 miles in stream heating.
- There is a 5 degree variation in temperature at the mouth during this period when there were no changes in streamside other than a small amount of growth. This illustrates the natural temperature variation resulting from weather related factors (streamflow, cloud cover). Summer streamflow in 1992, the warmest year, was very low. In 1993, the coolest year, summer streamflow was moderate.

Management Opportunities: There is very low likelihood of success in establishing vegetation in the serpentine and landslide areas impacted by the 1964 flood.

Figure 9, Stream Shade and Temperature Modelling



FISHERIES CHARACTERIZATION

The Lawson Creek watershed is about 25,000 acres in size and is an important tributary to the lower Illinois River. The Illinois River (628,500 acres) is the largest tributary of the Rogue River, and the Rogue River is the largest coastal stream in Oregon (about 3,301,000 acres). In comparison to other watersheds in the lower Illinois, Lawson is about half the size of either Indigo Creek (49,200 acres), or Silver Creek (52,200 acres). Together, Indigo and Silver Creek provide approximately 1/3 of the Illinois River flow during low flow periods.

The Rogue River Basin is reported to produce more chinook salmon than any other coastal stream. The salmon that leave the Rogue River are believed to have a southward migration. A draft Oregon Department of Fish and Wildlife report on coho salmon in the Rogue Basin, stated that the Illinois River may be the last stronghold for wild coho in the Rogue Basin.

Lawson Creek has about 4 miles of habitat that fall chinook salmon can access, and winter steelhead can access about 9 miles of habitat. Although Lawson is important to the anadromous fishery production of the Illinois River, Indigo and Silver Creeks have about twice as much accessible habitat. Indigo Creek has 8 miles of fall chinook habitat, and 26 miles of winter steelhead habitat. Silver Creek has 8 miles of fall chinook habitat, and 21 miles of winter steelhead habitat. Migratory (most likely fluvial) coastal cutthroat trout are known to inhabitat Lawson, Indigo, and Silver.

What is the physical and biotic character of fish habitat in the Lawson Creek watershed?

In answering this question emphasis will be placed on the 3 basic elements of anadromous salmonid habitat as outlined in the Siskiyou Land and Resource Management Plan (LRMP). Those three elements are migration habitat, rearing habitat, and spawning habitat. Reference or historical conditions and current conditions will be detailed.

Reference Conditions

There is very little information available on the historic habitat conditions of the Lawson Creek watershed or its fish populations. To describe historic habitat conditions, the 1940 aerial photos will be used. There is no quantitative information on historic conditions of fish populations in Lawson Creek. Historic fish population trends in the Rogue River Basin is all that is available.

Fish Populations

As early as 1861 the salmon runs of the Rogue were said to be as large, or larger, than those that existed in many streams in Alaska. R. D. Hume established the first cannery at the mouth of the Rogue River in 1876. After 12 years of trial and error, Hume believed he had increased the Rogue River salmon runs fourfold (Rivers 1963). (For additional information regarding Rogue River Historical Fish Populations, see Rivers 1963.)

No historical information was found on the fish species present in Lawson Creek or on their distribution. However, information was found on fish stocking that occurred in Lawson Creek in the 1930's. There are no specific dates but an Agness Ranger District record was found that stated Lawson Creek was stocked with 3000 three inch steelhead annually. A record was found that in 1939, 24,000 two inch steelhead were released in Lawson Creek. According to the map located with the release records for 1939, fry were placed at approximately river mile 4.0 where the Lawson Creek trail crosses the stream. This release location is within the current range of anadromy. Also with the release records for the Agness Ranger District was information stating that habitat in Lawson Creek was "average", fish food presence was "average", fishing pressure was "heavy", and a temperature of 65 degrees Fahrenheit was recorded as the maximum summer temperature. Except for the 1939 release records, it appears that the Agness Ranger District fish were trucked to Oak Flat and taken by horse 1 mile up Lawson. This may be where the "65 degree" reading was taken.

Fish Habitat

There is no quantitative information on historic aquatic habitat conditions in Lawson Creek. The only historic information found has been mentioned above. Information was gathered and analyzed by using the 1940's aerial photos to estimate historic habitat conditions. Three aspects of fish habitat will be discussed. They are: large wood supply to Riparian Reserves, sediment, and stream temperatures.

Large Wood

Large wood plays an important role in the formation of aquatic habitats. Large wood is delivered to streams through landslides, from adjacent riparian areas, and by transportations from upstream areas.

Using the 1940 photos it was determined that 373 acres of Riparian Reserve was in an early seral stage condition (0 to 40 years old), 2276 acres was in an immature condition (41 to 100 years old), and 3038 was in a mature to old growth condition (101 to 200+ years old). Timber harvest had not yet occurred in the watershed.

Sediment

NOTE: For a detailed description of hillslope processes in the Lawson Creek Watershed, see Geology and Hydrology reports.

The 1940 aerial photos show evidence of mass soil movement activity along the mainstem of Lawson Creek. These photos were taken before any timber harvest activities took place in the watershed. There was little evidence of mass movements in the forks of Lawson. Aerial photos taken after the flood of 1964 show an increase in slides in tributaries and along the mainstem.

Temperature

See the Hydrology section of this watershed analysis for information on temperatures in Lawson Creek.

Current Conditions

Migration Habitat

The Siskiyou LRMP states that salmonid aquatic habitat will provide for upstream and downstream migration for both juvenile and adult salmonids. Management prescriptions in the LRMP state that the Forest Service should improve or develop fish passage at culverts, natural falls, velocity barriers, etc., where desirable, in cooperation with Oregon Department of Fish and Wildlife (ODFW). ODFW's current policy on passage is to not introduce anadromous fish where they have not historically occurred.

There are no known barriers to migration caused by culverts in the watershed. There are natural blockages to fish passage. A cascade reach begins at approximately river mile (RM) 3.8. No adult or juvenile salmon have been observed above this cascade. Steelhead are able to negotiate the cascade as adults have been observed upstream of this reach.

At approximately RM 5.6 a waterfall occurs. This waterfall is approximately 8 feet high, and the plunge pool below is approximately 10 feet deep. It appears that steelhead could get above the falls at bankfull flow conditions. However, there are very large boulders below the falls at the plunge. These boulders appear to be a hindrance to upstream migration by increasing the horizontal distance that must be covered in the leap. Adult steelhead have not been observed above this waterfall by Forest Service or ODFW fish biologists. However, anecdotal information collected from individuals that have been camping along Lawson Creek since the 1950's at RM 6.5 provides a source of information that adult steelhead have been above the falls at RM 5.6.

The next major waterfall occurs at RM 9.51. This is a significant series of waterfalls and a chute. It is believed that steelhead are not able to negotiate these falls at any flow conditions. Above this barrier it is believed that only resident fish exist. There are other waterfalls in the mainstem and the South and North forks that are definite barriers to resident salmonids. These waterfalls should be successful in isolating the South and North Fork fish populations.

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Overhead and Instream Cover

Overhead cover was not found to be a major component of rearing habitat in Lawson Creek. Instream cover appears to be more of a factor. Instream cover was found to be in excellent condition in the mainstem for summer rearing. The dominant forms of instream cover observed were: substrate, depth, and turbulence.

Substrate cover typically comes in the form of large boulders. Many reaches of Lawson have active slides along the mainstem. These slides have deposited many large boulders that have added to the complexity of stream habitats. Turbulence cover is typically found in riffles, cascades, and at the heads of pools.

Large wood plays an important role in fish habitat. It helps to form habitats, provides cover, stabilizes spawning gravels, and is a substrate for organic decomposition. Lawson Creek is a large, powerful stream system. Therefore, a piece of wood needs to be large to be maintained within the system. Much of the large wood observed during riparian inventories occurred on the margins of the stream, or in high water areas. In general, as the inventory progressed further upstream there was a marked increase in the amount of large wood. Pieces of large woody material per mile, per reach, ranged from 6.6 to 174.2.

Current seral stage conditions in the Riparian Reserves of Lawson Creek are as follows: early seral stage - 985 acres; immature seral stage - 356 acres; mature to old growth - 4346 acres. Currently, there are 1,308 more acres of mature to old growth conditions in Riparian Reserves than there were in 1940. This shows a trend of increasing maturity to old growth in the Riparian Reserves.

Many of the slides that occur along the mainstem of Lawson Creek are devoid of large coniferous trees. These slides are natural. Due to the large number of slides, there are many gaps in riparian habitat connectivity. In many cases, alders are having a hard time colonizing these serpentine slides.

Low Gradient Habitats

Low gradient habitats are important for summer and winter rearing, and spawning salmonids. These low gradient habitats are also susceptible to sedimentation, and solar temperature influences.

In the Siskiyou LRMP, examples of low gradient habitats include: side channels, glides, and overwintering areas. The low gradient reaches have been identified. These reaches are "pool and riffle" type areas (gradient from 0.5 to 2.0 percent) (see Figure 10 Low Gradient Reaches).

Side channels were only observed in reaches 1,3,4,6,8, and 9. The side channels in reaches 1 to 4 are critical areas for overwintering coho. The only juvenile coho observed in the 1990 riparian inventory were in a side channel in reach 1. Due to the low amount of side channels observed in the stream, winter cover habitat may be a factor limiting abundance. Overwintering cover is also important for juvenile steelhead and resident trout.

Spawning Habitat

Important components of spawning habitat identified in the LRMP include: instream cover in the form of large wood, intragravel fines (less than 2 mm in size) no greater than 20 percent above existing background, and quality and quantity gravels.

Good quantitative information on the percentage of fine sediment in spawning gravels are unavailable. During the riparian inventory, embeddedness is determined by examining cobbles at pool tail outs. If the cobble is more than 35 percent embedded in fine sediment, it is deemed "embedded" by the Stream Management Analysis Reporting and Tracking (SMART) database. The database then gives an overall picture by reach. Only 2 reaches, reaches 1 and 4, "on average" were shown to be embedded 35 percent by the database. However, this does not truly assess the condition of spawning habitat in Lawson Creek.

Rearing Habitat

Emphasis is placed on the following elements of "rearing habitat": water temperatures, pool depths, overhead and instream cover, instream woody debris, and low gradient habitats (eg. side channels, glides and overwintering areas). This section will discuss what is known about rearing habitat elements in Lawson Creek.

Water Temperatures

Stream temperatures have been monitored in Lawson Creek since 1989. For a review of the temperature data that has been collected, see the Hydrology Section of this watershed analysis.

Stream temperatures that range from 45 degrees Fahrenheit (F) to 59 degrees F are considered "optimum" for salmonids (Siskiyou LRMP FEIS). Temperatures that range from 59 degrees F to 69 degrees F are considered "less than optimum". From 69 degrees F to 75 degrees F it is believed that growth ceases, and when temperatures get above 75 degrees F, mortality can occur. With that as a reference, stream temperatures where monitoring has occurred are well above optimum and may be a limiting factor during certain portions of the summer to salmonid survival.

Reeves et al. (1987) showed that stream temperatures influenced the competitive outcomes for habitat between juvenile steelhead and redside shiners. Reeves found that at warmer water temperatures (66.2 to 71.6 degrees F) redside shiners were able to out compete juvenile steelhead for preferred habitat. In cool water (53.6 to 59.0 degrees F), juvenile steelhead production is not influenced by the presence of redside shiners.

Steelhead and redside shiners are sympatric in the first reach of Lawson Creek. The temperature data that has been collected shows that during peak temperatures periods in the summer redside shiners have the competitive advantage over juvenile steelhead.

Everest (1973) discussed a study that looked at *Cytophaga columnaris*. This study conducted by Fish and Tucker (1945) showed that the virulence of the disease is directly related to water temperature. They stated, "that among cold water fishes, columnaris disease is of little consequence to fingerlings at water temperatures below 55 degrees F, but becomes highly pathogenic at temperatures in excess of 70 degrees F.

Reeves et al. (1987) speculated that increased susceptibility to disease, as influenced by water temperature, may have modified interactions between redside shiner and steelhead trout; each species in the presence of the other at unfavorable temperatures was more susceptible to *Flexibacter columnaris*.

Macroinvertebrate samples collected at the mouth of Lawson Creek show that there is a notable absence of cool/cold water taxa, and that a few warm water indicators were present.

Pool Depths

During summer flows, pool depths of medium and small forest streams becomes critical and is considered an important limiting factor for 1+ age class steelhead, juvenile coho, and resident trout. The Siskiyou LRMP FEIS has identified the need for pool depths of 3 feet minimum for low-flow survival of juvenile steelhead and coho to the smolt stage. The Hankin and Reeves Riparian Inventory uses 3 feet as the minimum pool depth at which "depth" can be considered a form of fish cover.

All reaches identified in the mainstem of Lawson Creek during Hankin and Reeves Riparian Inventories had an average residual pool depth of greater than 3 feet (residual pool depth is the absolute minimum depth a pool would have). In the South Fork and North Fork there were reaches identified that had average residual pool depths that were less than 3 feet. However, these reaches had other forms of cover. Pool depths do not appear to be a limiting factor for salmonids in Lawson Creek.

Table 5. Population Status

Species	Rating
Fall chinook	High Risk of Extinction (Lower Rogue)* Depressed (Lower Rogue)**
Coho	High Risk of Extinction (Rogue Basin)* Depressed (Lower Rogue)**
Winter steelhead	no rating* Healthy (Rogue Basin)**
Coastal Cutthroat	Moderate Risk of Extinction (Coastal Tributaries)* Lack of inventory data precludes quantitative assessment of the status. However, it is believed that by 1980 populations may have already been much lower than historic levels due to habitat loss.**

*Nehlsen et. al. (1991), American Fisheries Society
**Nickelson et. al. (1992), ODFW

Population Trends

Fall Chinook: Chinook salmon in Oregon coastal streams from the Rogue River south are considered southward migrating in the marine environment. Studies by ODFW show that north-migrating chinook stocks are generally healthy, and south-migrating stocks are generally not.

During the last 10 years, many south-migrating populations increased from very low levels to very high levels in 1985-88 and have declined again to very low levels in 1991-92. For example, the run of spring and fall chinook salmon entering the Rogue River basin was about 30 thousand fish in 1983, increased to about 200 thousand fish in 1988, and declined to about 30 thousand fish in 1992.

Coho: Abundance of wild coho salmon spawners in Oregon Coastal streams declined during the period from about 1965 to 1975 and has fluctuated at low levels since that time. Little information is available on populations of coho salmon in Curry County, and they were probably never very large. However, the information that is available suggests wild coho populations in the Rogue Basin are at 10 percent of historic levels.

Winter steelhead: Steelhead populations vary in abundance from year to year for many reasons. Catch of all winter steelhead (hatchery and wild) in the Rogue was below average in 9 out of the last 10 years, 4 out of the last 5, and 2 out of the last 3.

Coastal Cutthroat: There are no consistent indicators of trends in abundance for most populations of sea-run cutthroat trout. However, anecdotal information, creel surveys, and fish counts at dams have raised concerns that sea-run populations in Oregon may be experiencing widespread decline.

Conclusions

- Riparian vegetation in the watershed is moving toward maturity and old growth.
- Habitat complexity for salmonid fishes is good.
- Roads in the watershed have been decommissioned since 1994 and this will aid in protecting Lawson Creek from anthropogenic disturbance.

Management Opportunities: Ensure that vegetative characteristics in the Riparian Reserves of managed stands have the diversity and density of vegetation needed to achieve Aquatic Conservation Strategy objectives. Continue to decommission roads that are not needed or pose ecological risks to aquatic resources.

Fish Populations

Lawson Creek provides habitat for a variety of species from the Family Salmonidae, and other families of fish. These include:

- fall chinook salmon
- winter steelhead
- Coastal cutthroat trout (both migratory and resident)
- Other fish that occur in the watershed include: sticklebacks (Family Gasterosteidae), sculpins (Family Cottidae), and redside shiners (Family Cyprinidae).
- Coho salmon juveniles have been observed in very limited numbers in the first reach of Lawson Creek.

Fish Distribution

Listed below are the known miles of fish distribution for the species observed in Lawson Creek. See Figure 11 for a map of fish distribution.

Table 4. Miles of Fish Distribution

Fish Species	Miles of Fish Distribution
Redside shiner	1.54 miles
Threespine stickleback	1.54 miles
Coho salmon	4.18 miles
Fall chinook salmon	4.18 miles
Winter steelhead	9.51 miles
Sculpin	9.51 miles
Coastal cutthroat	20.69 miles
Resident rainbow	20.69 miles

Population Status and Trends

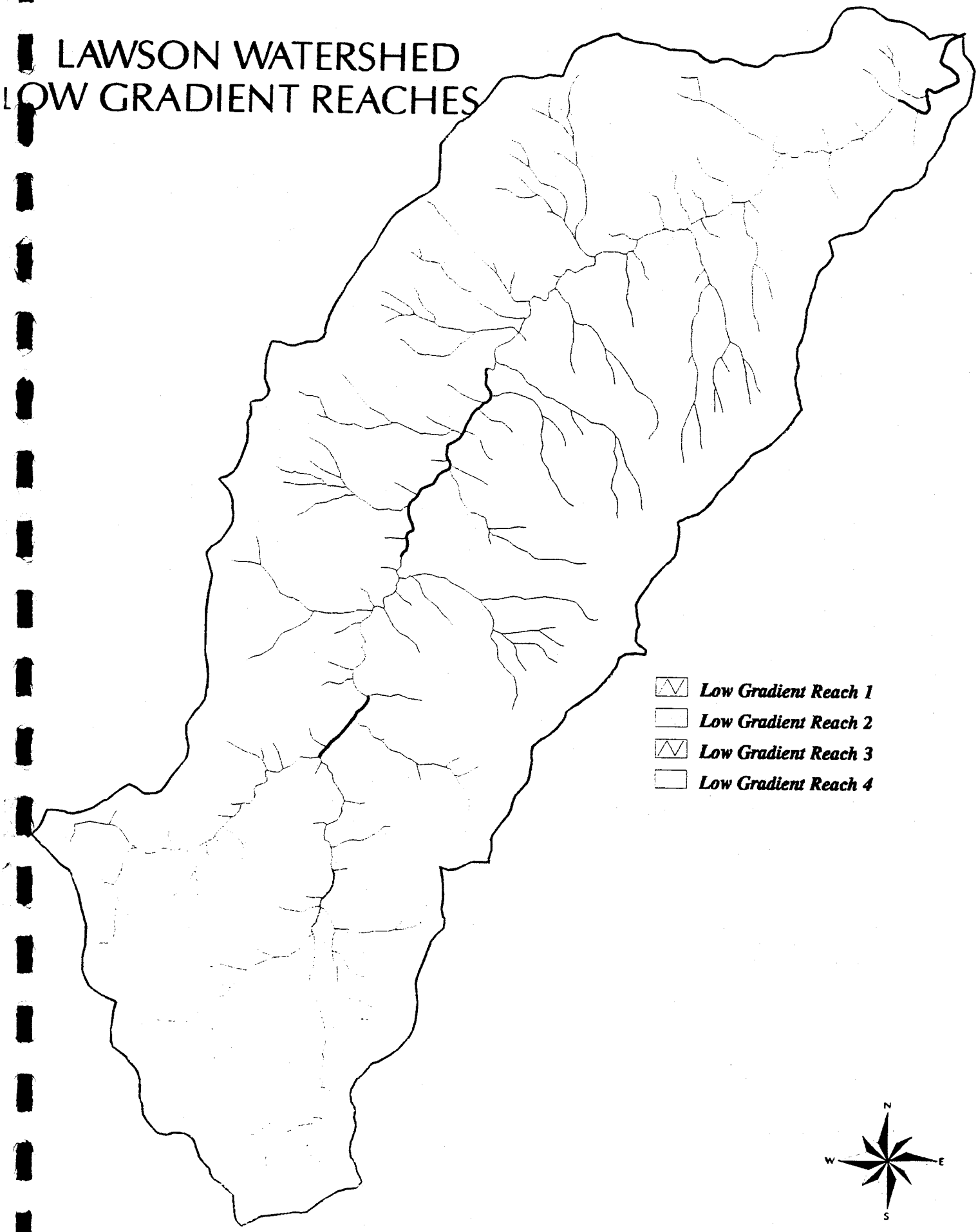
The following is a summary of population status and trends for anadromous salmonids that inhabit the Rogue River system. Summer steelhead are not listed below because they do not inhabit Lawson Creek.

Population Status

Two species are currently proposed for Federal listing on the Threatened and Endangered Species List. They are Klamath Mountain Province steelhead, and Northern California/Southern Oregon coho salmon. The following information was obtained from two reports that documented information on the status of anadromous fish populations.

Figure 10

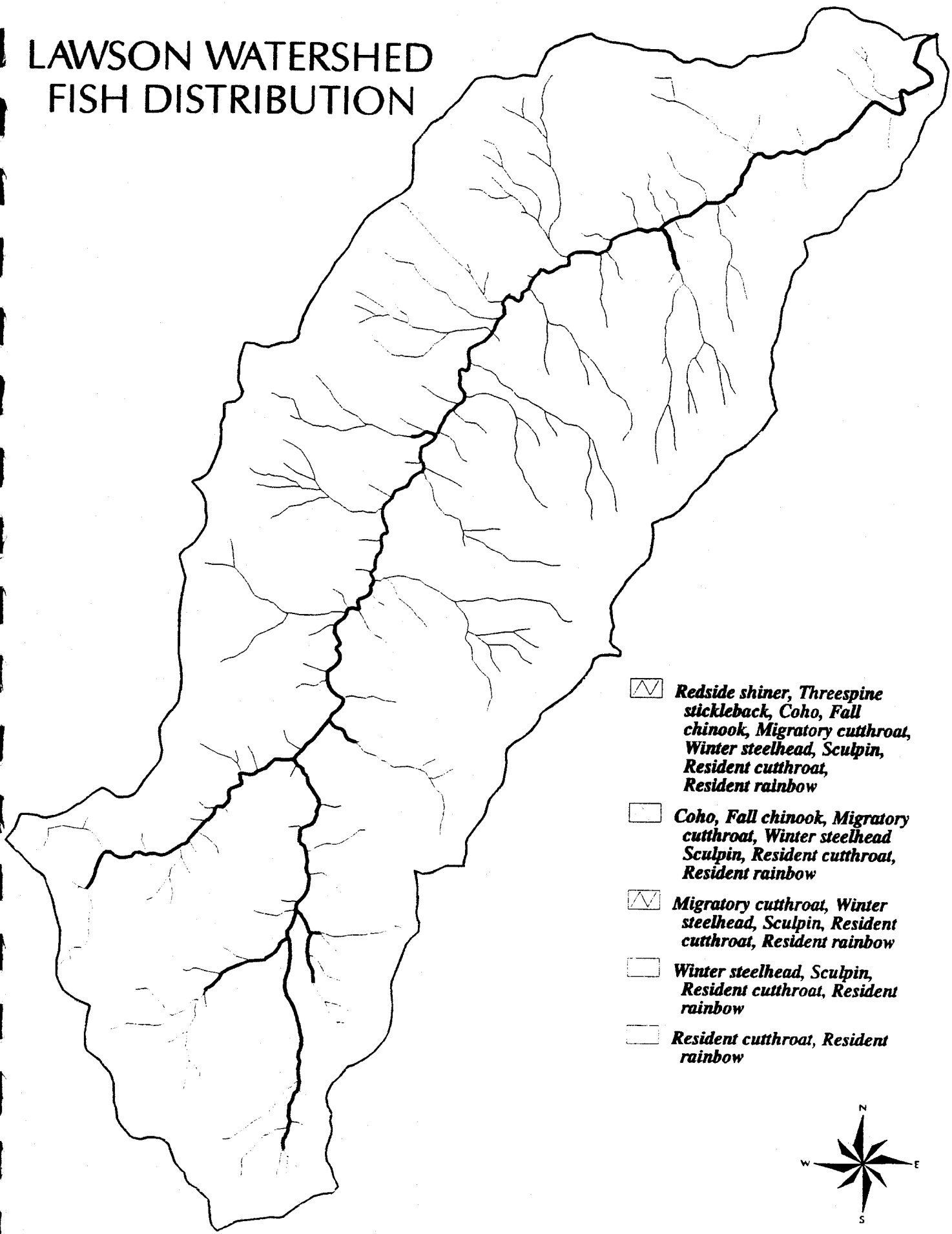
LAWSON WATERSHED LOW GRADIENT REACHES



DECEMBER 17, 1996

Figure 11

LAWSON WATERSHED FISH DISTRIBUTION



DECEMBER 17, 1996

RIPARIAN ECOSYSTEM NARRATIVE

What are the riparian processes in the watershed?

STREAM ECOSYSTEMS

Riparian Reserves should be managed to provide both food production and suitable physical habitats for fish. Both are necessary to sustain salmonid production (Murphy and Meehan 1991).

One important process that all Riparian Reserves share is "energy flow". There are two sources of energy for biological organisms in stream ecosystems: **autochthonous sources** (photosynthesis by aquatic plants in the stream itself), and **allochthonous sources** (decomposition of organic matter imported from outside the stream). The mix of energy sources has a major influence on the structure and function of stream ecosystems (Murphy and Meehan 1991).

Autochthonous sources of energy are affected by stream size, gradient, and exposure to sunlight. Allochthonous sources of energy contribute organic matter to the stream by four main pathways: litterfall from streamside vegetation; groundwater seepage; soil erosion; and fluvial transport from upstream. Organic matter from these sources differs in when and how it enters the stream, how it decays, and where it predominates (Murphy and Meehan 1991).

Nutritional Quality of Allochthonous Material

Most animals require food with a Carbon to Nitrogen ratio (C:N) less than 17:1 (Russell-Hunter 1970). Almost all forms of allochthonous organic matter have higher C:N ratios, so they require microbial processing to enhance food quality. The quality of various forms of organic matter varies widely, as measured by the C:N ratio. At the low nutritional end of the spectrum are woody debris and conifer needles (wood has a C:N ratio of 1,343:1); at the high end of nutritional quality are periphyton, macrophytes, and fast-decaying deciduous leaves (macrophytes 8:1 and alder leaves 23:1) (Murphy and Meehan 1991).

RIPARIAN RESERVES

Intermittent Streams

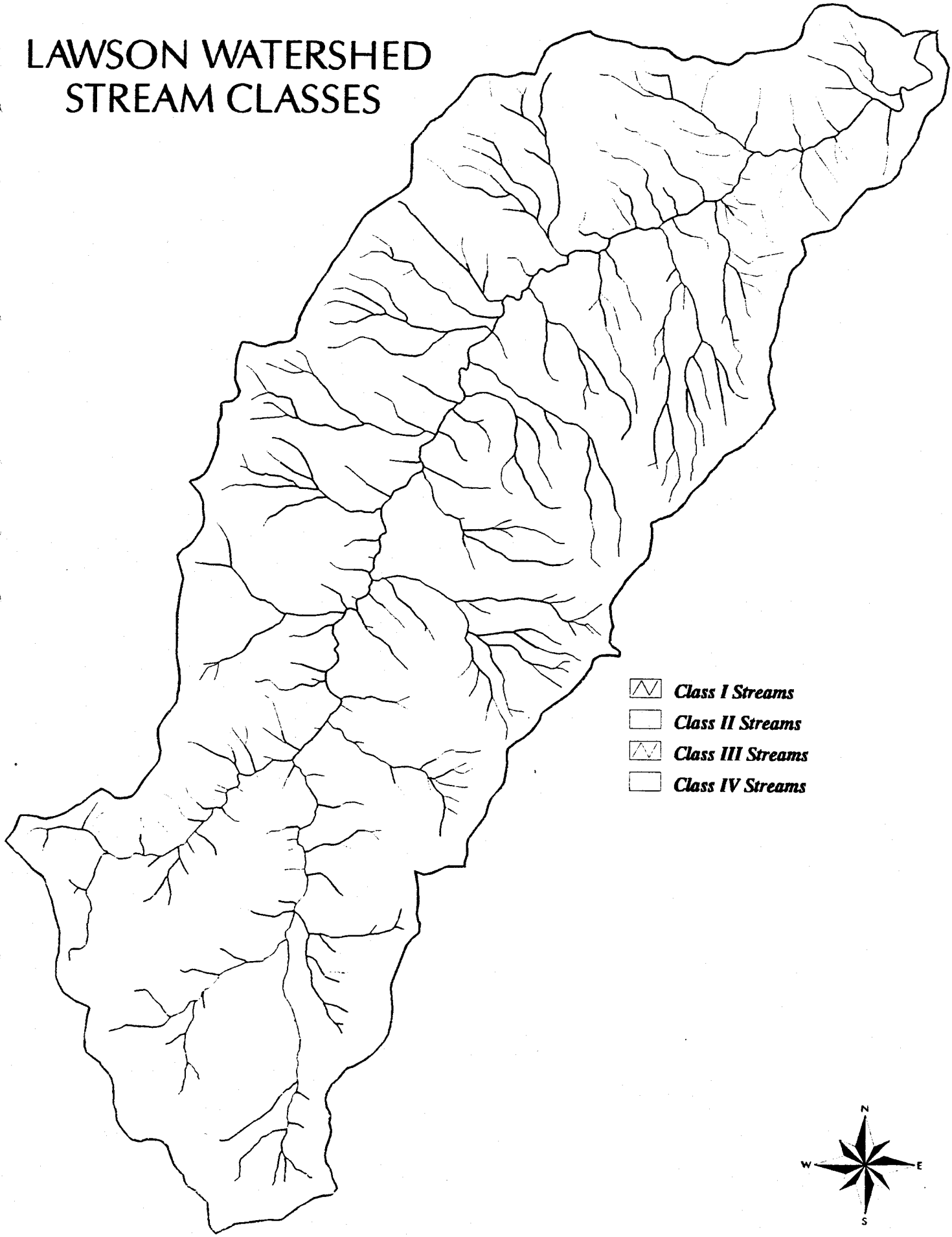
There are 11 miles of fish bearing stream (Class I), 16 miles of major tributaries (Class II) to the fish bearing streams, 67 miles of small perennial streams (Class III), and 53 miles of mapped intermittant streams (Class IV) (see Figure 12, Stream Classes Map).

Approximately 7000 acres of the Lawson watershed has been allocated to Riparian Reserve to protect these streams, (see Figure 13, Map of Riparian Reserves). An intermittent channel is defined by the Record of Decision (ROD) as "any nonpermanent flowing drainage feature having a definable channel and evidence of annual scour or deposition" (ROD pg. B-14 par. 2). This definition includes both "ephemeral" channels and "intermittent" channels. These two types of channels are distinguished by flow: ephemeral channels carry only stormflow, while intermittent channels are supplied by groundwater during part of the year (Reid and Ziemer 1994).

The biological importance can be different for ephemeral and intermittent channels and is dependent primarily on the presence of water and distinctive riparian vegetation. The most ephemeral channels may contain water for only a few days of the year and may not support riparian vegetation, so they are unlikely to have much on-site biological significance. Their major biological role is likely to be their influence on downstream channels through their supply of sediment, water, and organic materials, and management of their physical role may be adequate to preserve their biological function. These "most ephemeral channels" are likely to require special biological analysis and modified protection for biological resources only if there are biological considerations at these sites that are not captured by an analysis of sediment, water, and organic materials (ie. such as their use as migration corridors, or the presence of unique wildlife species) (Ried and Ziemer 1994).

Figure 12

LAWSON WATERSHED STREAM CLASSES



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Intermittent channels in the Lawson Creek watershed are important to fish resources as seasonal sources of water, sediment, allochthonous material, and large wood. Because intermittent channels can form a high proportion of the entire channel system in a watershed, they contribute a lot of nutrients to downstream reaches (Ried and Ziemer 1994). It is therefore important to maintain their allochthonous material input. These small streams are the most easily influenced by forest management activities and any manipulation of the canopy or streambank vegetation will influence the streams energy supply (Chamberlain et al. 1991).

Intermittent channels can also be important to amphibians. Most amphibians require water for reproduction, and some need open water throughout the year. These streams may be particularly important as nursery areas for amphibians because these sites support fewer predators than perennial channels (Ried and Ziemer 1994).

Conifer riparian areas have a moist microclimate that is important to a variety of amphibians. For example, Pacific giant salamanders utilize headwater streams to lay their eggs (Stebbins 1966), and talus habitat in these moist areas can be important for Del Norte salamanders.

Intermittent channels and associated riparian zones provide an important source of food and water for hillslope ecosystems, they can function as travel corridors, and they can provide microclimatic refuge for hillslope animals during times of thermal stress (Ried and Ziemer 1994). The distinctive vegetation and higher moisture content of these sites can modify fire behavior, so their distribution can affect the patchiness of large burns.

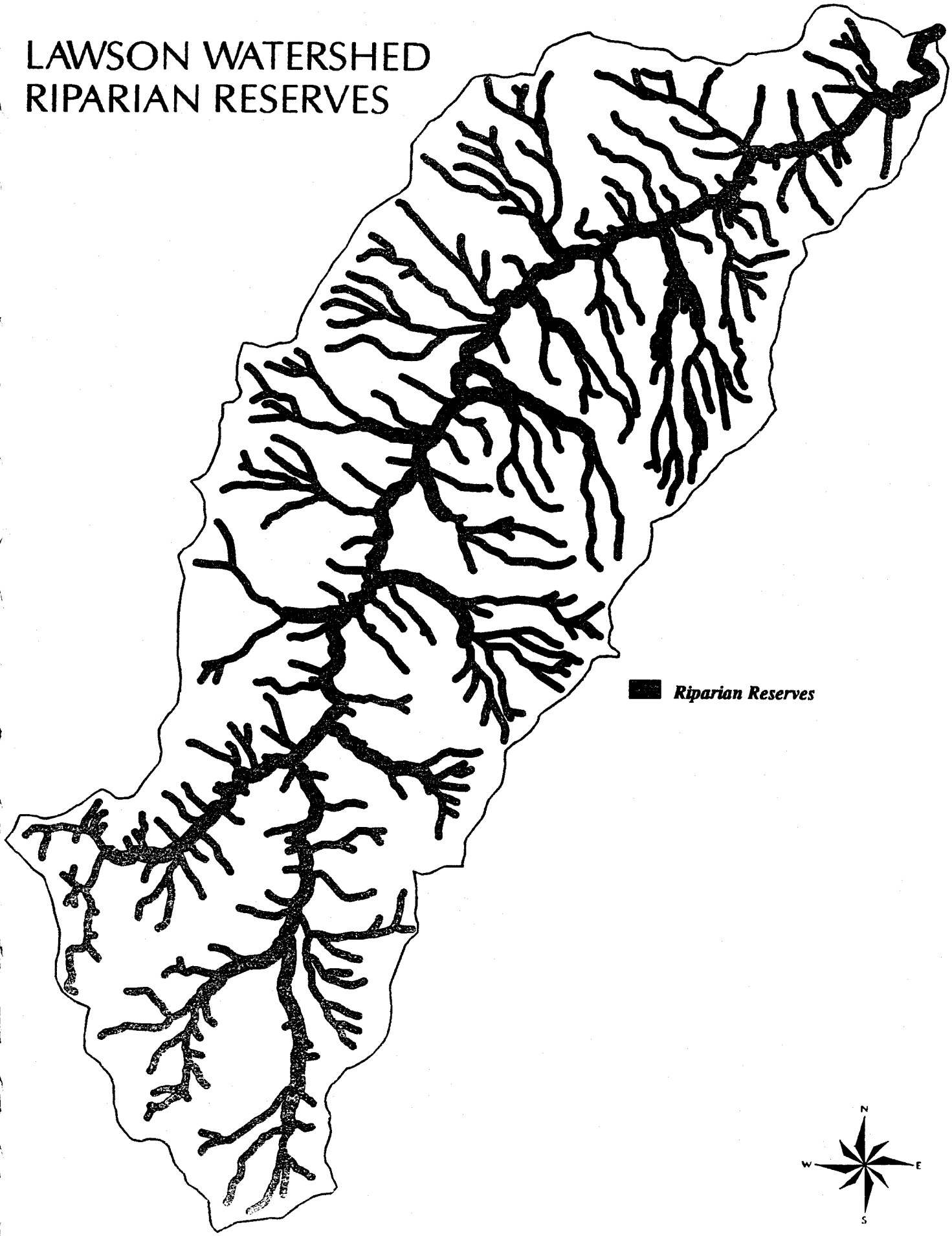
Perennial and Fish Bearing Streams

Keeping in mind the logic used to discuss "biological significance" for intermittent streams, perennial streams would be more significant biologically than intermittent streams. The ROD stated that "although Riparian Reserve boundaries may be adjusted on permanently-flowing streams, the prescribed widths are considered to approximate those necessary for attaining Aquatic Conservation Strategy objectives" (ROD pg. B-13). Also, these approximate widths are necessary to maintain riparian processes.

The importance of fish bearing streams is discussed under the fisheries, hydrology, and geology sections of this watershed analysis. In general, salmonids are affected by both the physical conditions of their habitat, and the energy flow processes occurring in the watershed.

Figure 13

LAWSON WATERSHED RIPARIAN RESERVES



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VEGETATIVE CATEGORIES

Riparian zones in the Lawson Creek watershed can be stratified into four distinct categories based on vegetative characteristics. These are conifer forest, hardwood forest, meadows, and riparian areas on soils developed in serpentinite and peridotite (ultramafic soils). Each category has its own processes for sediment delivery, channel formation, hydrologic regime, susceptibility and response to change, microclimate qualities, flora, fauna, and migration habitat qualities. Potential riparian restoration sites have been identified in the large wood, sediment delivery, and fish habitat discussions.

Conifer Forest Riparian

The most abundant riparian type in the Lawson watershed is the conifer riparian forest. It is generally located on soils with high to moderate productivity, where water supply is not limiting growth and topography tends to exclude frequent or intense fire. Abundant, tall conifers dominate these riparian areas. Douglas-fir is by far the most common overstory conifer, with Port-Orford-cedar often present. Pacific yew has very scattered distribution.

The stand canopy is closed in these areas and many stands have multi-layered canopies. Hardwood trees are often an important mid-layer component. Conifers, with the exception of cedars, create more acidic soils through litterfall than hardwoods. The evapotranspiration associated with the numerous large trees is high. Air temperatures are cool and diurnal fluctuations are moderated throughout the year. These riparian ecosystems maintain important microclimates.

The stands are generally very stable. Tanoak seldom reaches climax condition due to the time-span required for this succession and the longevity of dominant conifers (200 to 300 years). Fire does not start or carry well in most of these stands. Light disturbance from windthrow, land movement, wind or snow damage leads to continual recruitment of conifers. In the event of large scale disturbances these riparian stands are slow to recover to a mature state. Where Port-Orford-cedar is present in the riparian zone, roads and streams are important conduits for *Phytophthora lateralis*.

Conifer stands often have a higher percentage of perennial streams than other vegetation types. Root strength and often dense undergrowth contribute to generally stable stream banks. However, riparian conifer stands can develop on earthflows, and exhibit features of deep-seated instability. Earthflows can be important sources of structure for stream channels by providing boulders and large wood. Throughout conifer riparian areas, large wood in the form of limbs and boles is continuously delivered to and incorporated into the channels. Stream temperatures tend to be cool throughout the year. Tall trees can shade even moderately wide channels in summer.

Where coniferous riparian areas are surrounded by similar upland stands they are important water sources for interior habitat-dependent wildlife. When they are dissimilar to the surrounding upland habitat, they are important uphill-downhill dispersal corridors for interior species. Stable air temperatures make them valuable thermal refugia in extreme weather for many wildlife species. These riparian stands can be important habitat for spotted owls.

Riparian stands of red alder are generally an early to mid-seral stage of the riparian conifer forest. These stands were usually created by stand replacement events such as timber harvest, debris flows and inner gorge landslides. In some areas red alder is an important component of a mature conifer riparian ecosystem. These alder stands can be important habitat for white-footed voles, and alder leaves are a good source of nutrients for the aquatic ecosystem.

Because of its abundance and high value wood production, more land use activities have occurred in conifer riparian stands than in any of the other riparian types. Therefore, conifer riparian stands are most likely to be candidates for restoration.

Port-Orford-cedar is often the primary overstory component in riparian areas. Port-Orford-cedar grows slowly on these sites, generally reaching 30 inches in diameter in 400 years on seasonal streams and 30 inches in 200 to 300 years in perennial wet sites. It will remain standing long after it dies. While Port-Orford-cedar has a slow decomposition rate, the sparse vegetative cover on ultramafics creates a low fuel load. This, in turn, results in low intensity fires when fire occurs.

Phytophthora lateralis is an introduced pathogen that kills Port-Orford-cedar, reducing shade and concentrating the delivery of large wood. Mortality rates in well-established disease sites are generally higher in the flat, wet sites and lower on steeper stream sections where spores cannot catch on to roots as easily. The rate at which Port-Orford-cedar dies from the introduced root disease could likely cause the population size to fall outside the range of natural variability.

Ultramafic rocks weather to produce landforms with unique topography and hydrology, often prone to mass wasting and erosion in areas with heavy precipitation. The highly sheared structure and low water permeability of the ultramafic rocks result in frequent springs and bogs, flashy flows, inner gorge landslides, and highly erodible stream channels which are sensitive to ground disturbance. The interaction of stream flow with large boulders and resistant outcrops can result in a diverse channel morphology. Because ultramafic riparian areas have fewer trees than conifer or hardwood riparian, there is less large wood providing structure in the stream channel. However, when large Port-Orford-cedar is delivered to the channel, it decomposes slowly and functions as structure for a longer period of time than a similar piece of Douglas-fir. Because of the open canopy, stream temperatures are usually much warmer than in streams bordered by dense conifer or hardwood forest. The soil chemistry results in higher pH water than in streams which flow through other soil types.

Although plant diversity is high, terrestrial vertebrate diversity and abundance is low. This is a result of the low thermal cover and low availability of forage. Most use by terrestrial vertebrates is seasonal. Riparian areas are important both as water sources and as travel corridors.

Restoration in sparsely vegetated ultramafic areas have had limited success. Development of disease-resistant Port-Orford-cedar and five-needle pine species could improve the success of regeneration in ultramafic riparian areas.

Information Needs: Site-specific analysis and surveys to support management activities within Riparian Reserves, as described in the Record of Decision for Amendments to Forest Service and Bureau of Land Management Planning Documents Within the Range of the Northern Spotted Owl (ROD).

Management Opportunities: Implement management activities within Riparian Reserves which preserve the critical riparian processes described for each riparian type and meet the objectives of the Aquatic Conservation Strategy. Where site-specific analysis determines that the critical riparian process described above can be met, adjust Riparian Reserve boundaries in accordance with ROD pp. B-13 and C-31. Restore riparian processes where they are not properly functioning. Specifically:

> Meadows have been encroached upon by conifers due to the exclusion of fire. Riparian ecosystem processes that have been described above should be maintained during restoration efforts.
>
> Riparian thinning and/or planting in existing managed stands is a possible management opportunity. Apply silvicultural practices for these riparian areas to control stocking, reestablish and manage stands, and acquire desired vegetation characteristics needed to attain Aquatic Conservation Strategy objectives.

Hardwood Forest Riparian

Hardwood-forested riparian stands tend to replace conifer-forested riparian stands where water is limiting or where a regime of either frequent low intensity or high intensity fires has disturbed the riparian zone. Hardwood riparian stands are dominated by tanoak trees, with madrone, myrtle, chinquapin, knobcone and sugar pines often present. Scattered conifers such as Douglas-fir will grow directly out of the stream channel, where there is more water, but they are anomalies.

Although the canopy is closed, the single-storied structure does not have the insulating qualities of the conifer forest. Humidity is much lower and air temperatures vary a great deal with the seasons. The microclimate differs little from surrounding upland. Fire will both start and carry well in the riparian stands. These stands have low resistance to change from fire and wind and snow damage. Yet their closed canopy, single-storied structure is quick to regenerate.

These stands most frequently surround seasonal streams. During the season of flow, stream temperatures are cool as a result of the closed canopy. Stem density can be very high and subsequent root strength combined with less water leads to generally stable banks. Ground cover is usually low, leading to more surface erosion than conifer riparian stands.

Hardwood riparian stands are generally similar to their upland surroundings, making them valuable watering sites for local wildlife. They are less important for thermal cover and migration corridors than coniferous riparian stands. Their acorn crop makes them important foraging areas for mast-dependent wildlife.

The economic value of the hardwoods is much lower than conifers, so far less timber harvest has occurred in these riparian areas. As a result, restoration opportunities in this riparian type are few.

Meadow Riparian

The majority of meadow riparian areas are open canopy areas. As a result, these types of riparian areas receive high amounts of solar radiation, have high diurnal temperature fluctuations, little microclimate differences, and a narrow range of influence beyond the active channel. Fire will start and carry very rapidly through meadow riparian areas. They are dependent upon frequent fire for maintaining their open canopy characteristics.

Stream channels tend to be along the margins of the meadows and are either seasonal creeks or perennial seeps or boggy areas. Light vegetative covering makes easily destabilized banks prone to downcutting and headwall erosion. Water temperatures show a strong diurnal fluctuation, similar to air temperatures. On-site diversity in these areas is low, yet may include highly specialized or unique species. Downstream aquatic diversity is increased because of the different types of production occurring at these sites.

Meadows provide a horizontal migration route. Riparian areas on their margins provide important water sites for the meadow-dependent species, but do not function as important migration corridors themselves. However, their location along the edge of the forest/meadow ecotone increases the on-site diversity of terrestrial species.

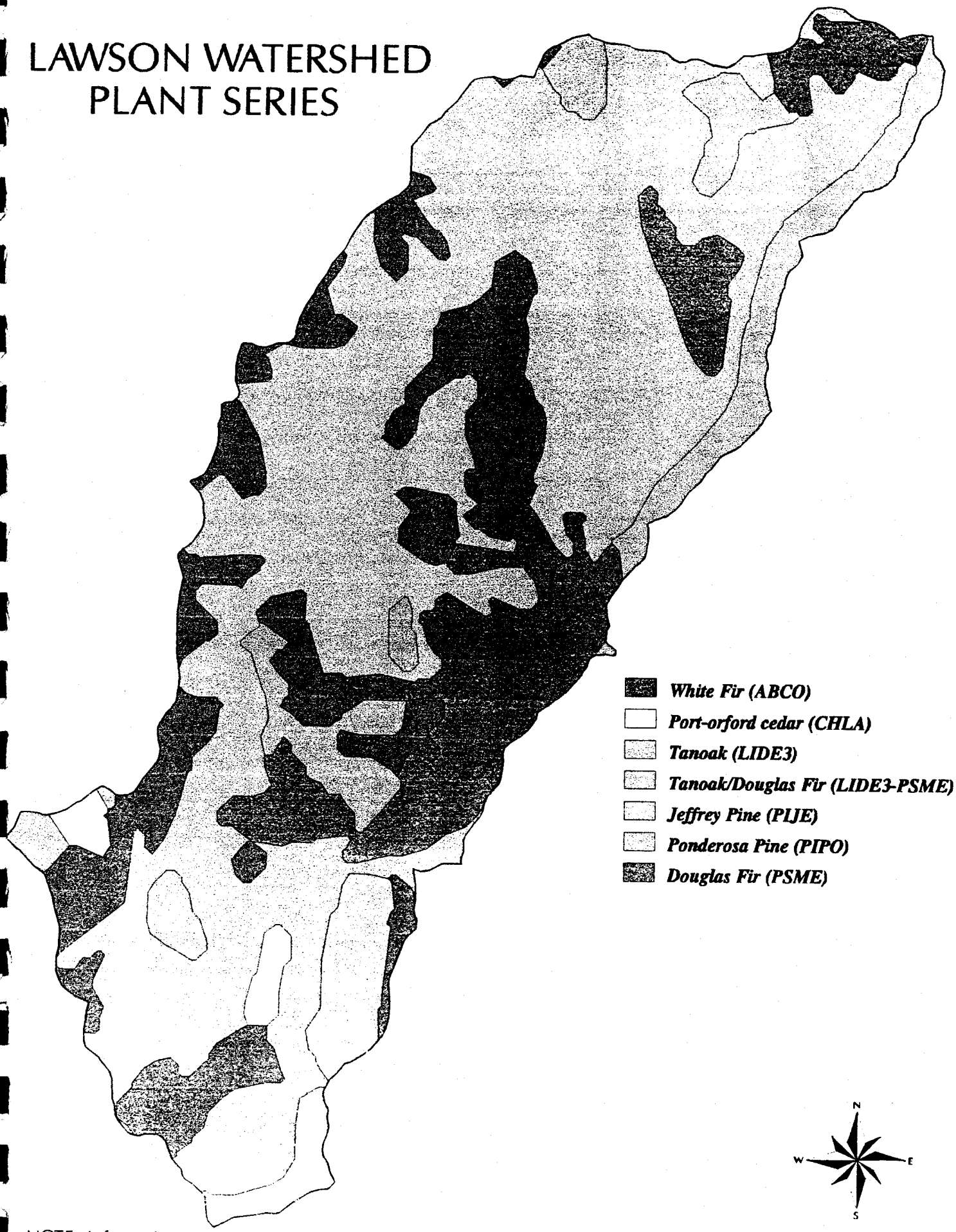
Ultramafic Riparian

At these sites high levels of magnesium relative to calcium, high levels of nickel and chromium, and low levels of available soil water limit plant species to those tolerant of these conditions. Ultramafic riparian areas support a high diversity of specialized plants, with many species being endemic or sensitive.

Most stands have an open to moderately closed canopy (20 to 70 percent). Understory vegetation cover varies from open to dense. Therefore, seasonal and diurnal temperatures fluctuate more than in other riparian stands. Ultramafic riparian stands provide a cooler, contrasting microclimate to the harsh upland ultramafic areas often dominated by open Jeffrey pine stands.

Figure 14

LAWSON WATERSHED PLANT SERIES



NOTE: Information provided by Southwest Oregon Late Successional Reserve Assessment, 10/95.

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TERRESTRIAL ECOSYSTEM NARRATIVE

Vegetative Characterization

The Lawson Creek watershed contains a diverse assortment of plant communities. Vegetative types in the Lawson watershed are variable due to: (1) the endemic and remnant plant species of the Klamath Province associated with ultramafic soils and isolation from glacial patterns; (2) the location of the watershed in a transition zone between the coastal face and the drier, inland Siskiyou habitats; and (3) the locally wide variation in aspect, soil types, and elevation.

The northwestern portion of the watershed contains old growth Douglas-fir, with light to moderate understories of hardwoods and brush. Open meadows can be also found along the western and northwestern perimeter, in the Wildhorse Ridge and Sevenmile Peak areas. A hardwood stand is designated as a unique habitat in the northwest part of the watershed. The southwestern portion of the drainage contains stands of mid-seral Douglas-fir that appear to be heavily influenced by past fires.

A large portion of the eastern half of the drainage is underlain by ultramafic (serpentine) soils that support a wide variety of conifers, including widely-spaced Jeffrey and western white pines on drier upper slopes and Port-Orford-cedar in wet areas. The Snow Camp Botanical Area, located in the upper southwest corner of the watershed, was designated for its diversity of unique habitats, including Bensoniella populations near the upper meadows and Brewer spruce near Huntley Springs.

The plant series in the watershed, listed by amount of acres, include: tanoak (13,841 acres), Douglas-fir (4,578 acres), white fir (3,209 acres), ponderosa pine (1,408 acres), tanoak/Douglas-fir (983 acres), Jeffrey pine (936 acres), and Port-Orford-cedar (288 acres) (see Figure 14, Plant Series Map). There are 29 plant associations in the watershed (see Figure 15, Plant Association Map).

Acres in the Port-Orford-cedar plant series are low, but this tree species occurs within other plant series and is found on approximately 17,000 acres. Port-Orford-cedar is a dominant in ultramafic wet areas on the east side of the watershed. It is a co-dominant in many Colebrook schist wet areas on the west side.

Approximately 5 to 10 percent of the 17,416 acres of the watershed that have Port-Orford-cedar are infested with the root disease *Phytophthora lateralis*, which has killed Port-Orford-cedar in the mainstem of Lawson Creek and in the North and South Forks. The extent of mortality ranges roughly from 10 to 30 percent of the cedar in infested drainages, with flat sites receiving higher mortality. Some Pacific yew has also been killed by the disease in the North and South Forks.

The Lawson Creek watershed, along with the adjacent Collier Creek and Windy Creek watersheds, are relatively disease free in comparison to Port-Orford-cedar areas from Coos Bay south to the Rogue River. A strategy of sanitation removal along main roads and closure of critical spur roads is under implementation.

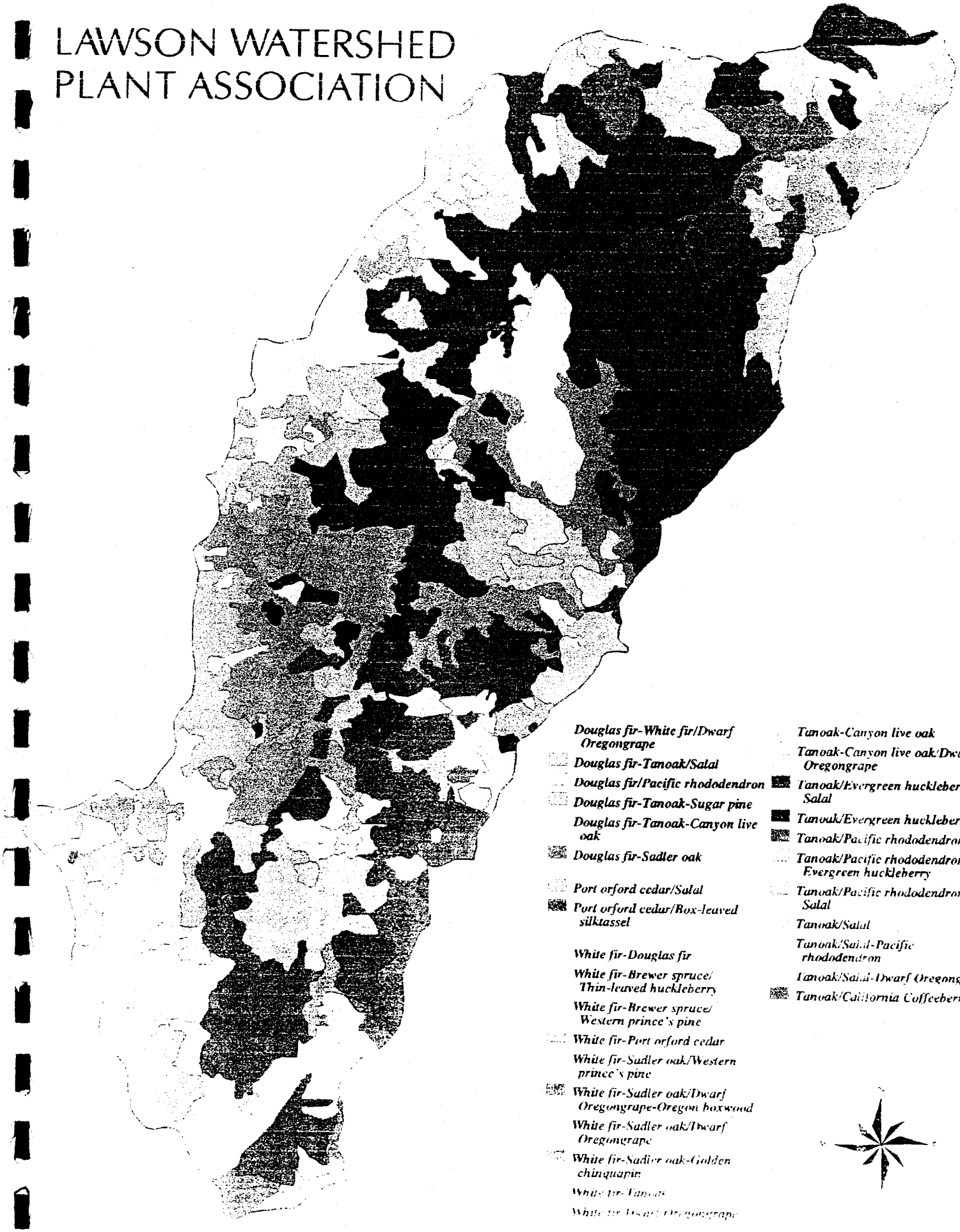
Timber harvest has also affected the vegetation patterns and has occurred on approximately 15 percent of the watershed (3,800 acres). Most of this was regeneration harvest. About 1,000 acres per decade were harvested from 1955 to 1990. Most of the harvest has been concentrated around the rim and in the lower west side of the watershed.

Sixty-nine percent of the watershed (17,430 acres) is currently classified as late-successional forest habitat (mature and old-growth seral stages). The watershed has a higher percentage of this habitat than adjacent watersheds such as Quosatana Creek or Pistol River. About 5,000 acres of this forest-type lies in riparian reserves.

Nine species of sensitive plants have been documented in the watershed. (See key question "What are the special and unique habitats in the watershed and how have they been changing.") The ultramafic soils of the eastern section of the drainage provide habitat for many plant associations interesting to botanists and plant enthusiasts. Vollmer's lily, California lady-slipper, and darlingtonia are among the plants that occur here.

Figure 15

LAWSON WATERSHED PLANT ASSOCIATION



Wildlife Habitat Characterization

The majority of the Lawson watershed is part of the larger Fish Hook/Galice Late-Successional Reserve (LSR). The western boundary of the Fish Hook/Galice LSR is the known inland extent for the range of the marbled murrelet on the Siskiyou National Forest and is within the Lawson watershed.

The late-successional habitat in the watershed provides important nesting habitat for the threatened northern spotted owl. Currently 47 percent of the watershed is suitable owl habitat.

Pioneer successional habitat (grass/forb/low shrub) in the watershed is found in recent (less than 15 years old) clearcut areas, meadows, open woodland areas and brushfield areas. About 4 percent (1,069 acres) of the watershed is currently in this habitat (see Figure 16, Seral Stages Map). The majority of the existing clearcut areas that are functioning as pioneer habitat will grow out of this condition within the next ten years. The meadow habitat is being encroached by trees.

The remaining 27 percent (6,722 acres) of the watershed is in early to mid-successional forest habitat which typically is smaller diameters trees with closed canopy (tall shrub, pole/sapling, immature, hardwood seral stages). The 1994 hardwood acres (4 percent of watershed) provide mid-successional habitat although many tanoak stands are climax forest (see Figure 16, Seral Stages Map).

What is the historic and existing late-successional habitat in the watershed?

Historic levels (pre-1850 to 1950) of late-successional forest have fluctuated over time due to climatic changes and human influence (Atzet, et.al. 1993). The Regional Ecosystem Assessment Report (USDA, 1993) estimated historic levels of late-successional habitat between 45 and 75 percent for the Lower Rogue Basin.

Excluding ultramafic lands, about 47 percent of the Lawson watershed is presently in late-successional forest (See Seral Stage Map, Figure 16). It is estimated 36 percent of the Lawson watershed provided late-successional habitat in the 1940's, prior to any timber harvest. Burning by Native Americans and early Euroamerican settlers probably reduced what could have been late-successional habitat in 1940 to lower levels. The exact percentage or level cannot be determined.

Late-successional forests are one facet of overall biological diversity. However, late-successional forests require special consideration because their integrity as functioning ecosystems and their ability to provide habitat to species associated with the forest interior that may be strongly influenced by stand size (Rosenburg and Raphael, 1986). Logging in the Pacific Northwest has reduced the size of late-successional forests, resulting in regionwide changes in wildlife species composition (Rosenberg and Raphael, 1986). On the Siskiyou National Forest much of the timber harvested has been on productive lower elevation sites. The amount of late-successional habitat on the Forest has been reduced nearly 26 percent since 1940 (Forest Plan FEIS, Chapter III-Affected Environment, page III-115).

Stands of late-successional forests are becoming isolated as harvest, fire and other activities disrupt connections between large, contiguous blocks of this habitat. This fragmentation threatens the ecological value of the remaining late-successional forests, including their value as habitat for forest interior plants and animals. The full impact of fragmentation of late-successional forests is not completely understood, but the populations and numbers of species associated with mature and late-successional forests can decrease if fragmentation, isolation, and reduction in stand size continues.

Interior forest habitat includes those portions of the late-successional forest areas that are not influenced by "edge effect." Edge effect is the result of changes in microclimate and species composition which are caused by an increased exposure to sun and wind. Edge effect penetrates a forest edge for approximately two tree lengths or about 400 feet into the forest interior, which is a guideline for the Pacific Northwest (Harris 1984; Franklin and Forman 1987). The preliminary results of current research (Spies et al. 1990) generally support this approximate distance.

Interior late-successional habitat was analyzed using GIS seral stages from stand level data. Interior habitat was determined by buffering in from openings in the forest. Buffering distances used were 400 feet from clearcuts or natural openings less than 40 years old, and 200 feet on immature or hardwood stands. Generally, stands on ultramafic soils are largely open and do not contain the same microclimates typical of closed canopy late-successional stands, so these stands were not included as interior late-successional habitat. A 400 foot buffer from these stands was not applied. Some of these stands may provide typical microclimates associated with closed canopies, but an analysis of each stand was not feasible.

Table 6. Distribution of interior late-successional forest blocks within the Lawson watershed (see Figures 17, 18, 19).

Historic Distribution of Interior Mature/late-successional Blocks in 1940

Block Size In Acres	Number of Blocks	Total Number of Acres
1-25	32	231
26-50	4	127
51-100	6	501
101-300	6	1100
301-500	3	1069
501-700	1	521
701-900	0	0
>901	1	1641
Total Interior Acres		5190

Current Distribution of Interior Mature/Late-successional Blocks in 1995

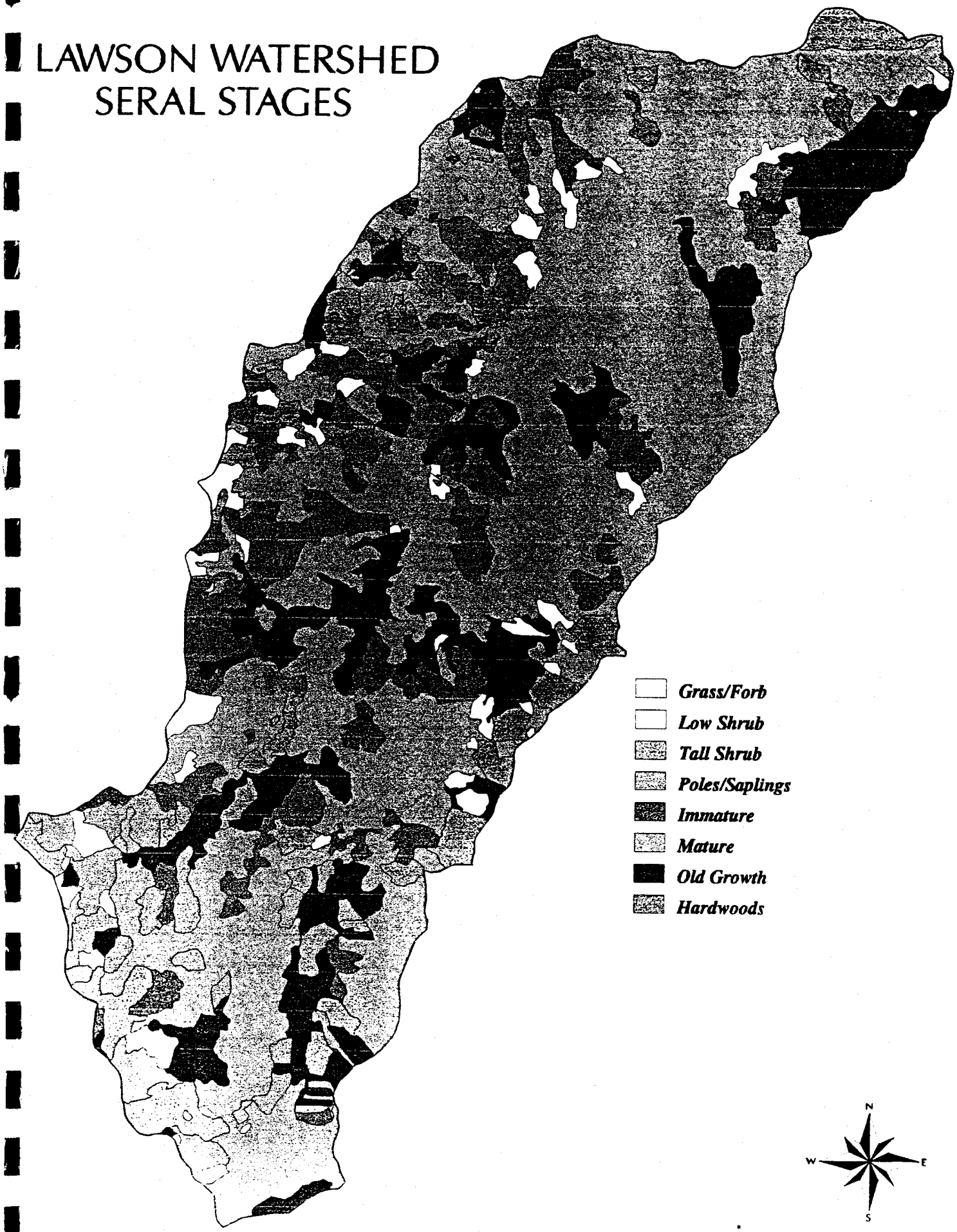
Block Size In Acres	Number of Blocks	Total Number of Acres
1-25	21	133
26-50	9	364
51-100	1	61
101-300	6	1189
301-500	1	410
501-700	2	1168
701-900	0	0
>901	3	2879
Total Interior Acres		6204

Future Distribution of Interior Mature/late-successional Blocks in 2040

Block Size In Acres	Number of Blocks	Total Number of Acres
1-25	13	109
26-50	1	49
51-100	1	51
101-300	2	589
301-500	1	312
501-700	1	666
701-900	0	0
>901	4	5020
Total Interior Acres		6796

gure 16

LAWSON WATERSHED SERAL STAGES



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The National Forest Management Act (36 CFR 219.19) requires the maintenance of viable populations well distributed throughout their current geographic range. Designation of Late-Successional Reserves (ROD, 1994) has been employed to accomplish this distribution. Forty-five percent of the watershed has been designated Late-Successional Reserve (LSR). Another 22 percent of the watershed will be managed towards a late-successional habitat condition through other land allocations.

The above tables show that there are currently greater amounts of late-successional habitat in the Lawson Watershed than there were in 1940. In addition, future projections indicate that the amount of late-successional habitat is expected to increase. This increase in late-successional habitat is in accordance with the 1994 ROD. The ROD further indicates that thinning or other silvicultural treatments may occur inside these reserves if the treatments are beneficial to the creation and maintenance of late-successional forest conditions. Although the Lawson watershed appears not to be the highest priority for stand treatment on the Forest because of relatively good late-successional habitat conditions, there may be opportunities for continued enhancement.

Information Needs: Determine which stands could be treated to improve late-successional habitat.

Management Opportunities: Development of late-successional structure can be accelerated through treatment of managed and natural stands. Approximately 3,832 acres of managed stands in the watershed could be treated to improve habitat for the northern spotted owl. However, the opportunity exists to prioritize which of these stands would benefit late-successional species the most (i.e. stands within home range of owls or within potential habitat connections).

The highest priority for commercial stand treatment to improve late-successional habitat are those stands that are mid-seral habitat adjacent to existing large late-successional habitat blocks and habitat connections. The next priority are those stands that are mid-seral habitat that will contribute to the landscape pattern of future late-successional forest habitat.

Figure 17

LAWSON WATERSHED INTERIOR OLD GROWTH 1940

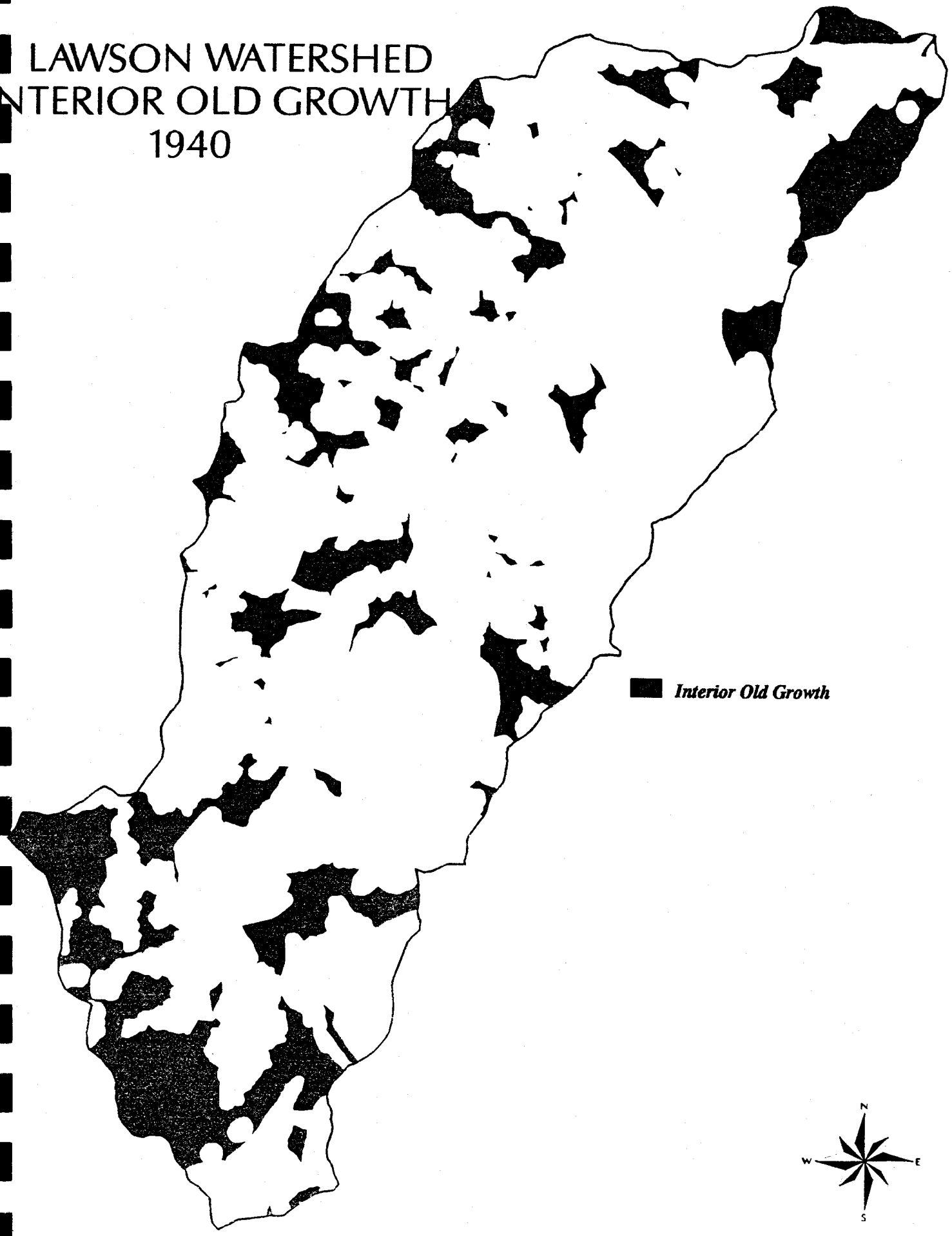

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Figure 18

LAWSON WATERSHED INTERIOR OLD GROWTH 1995

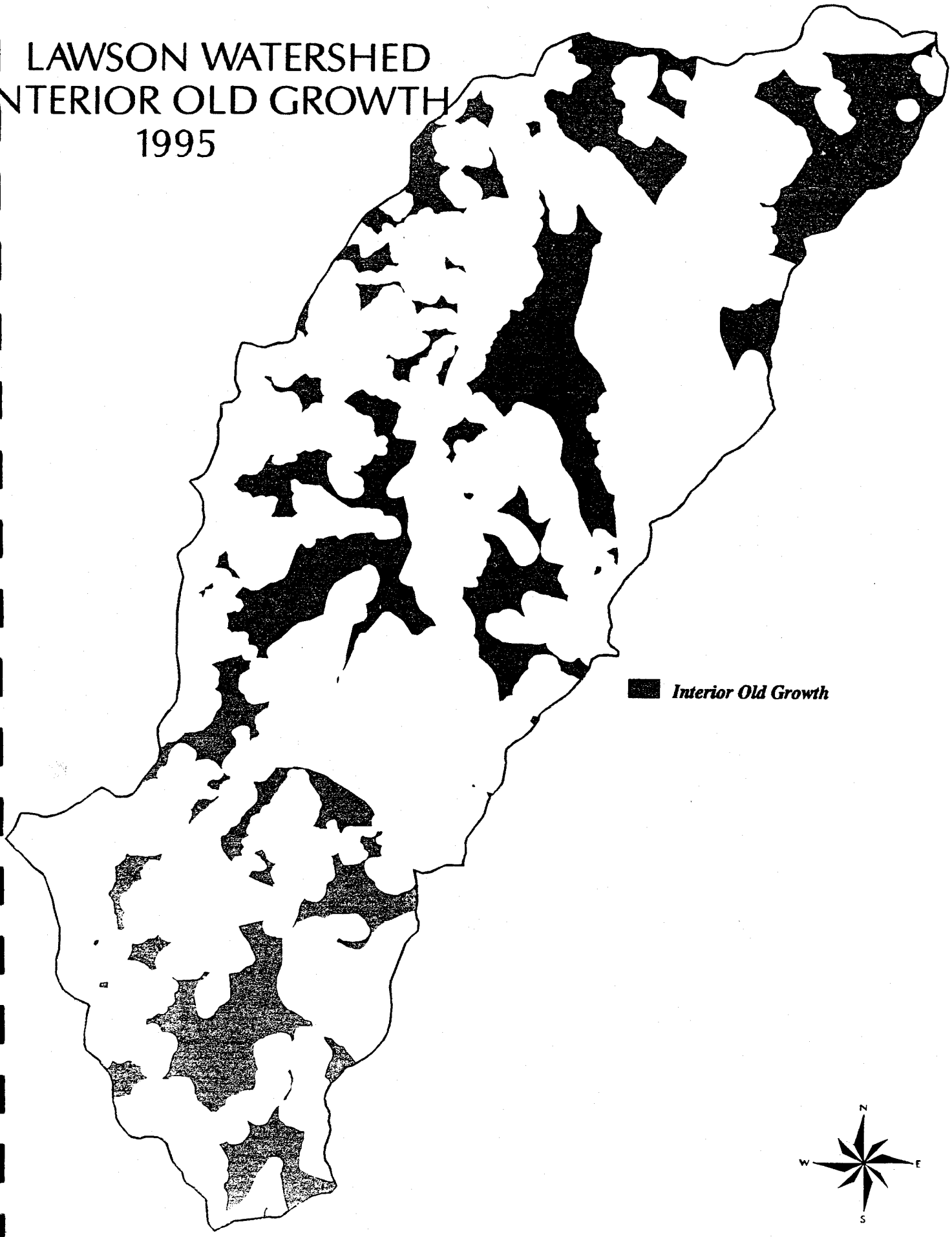

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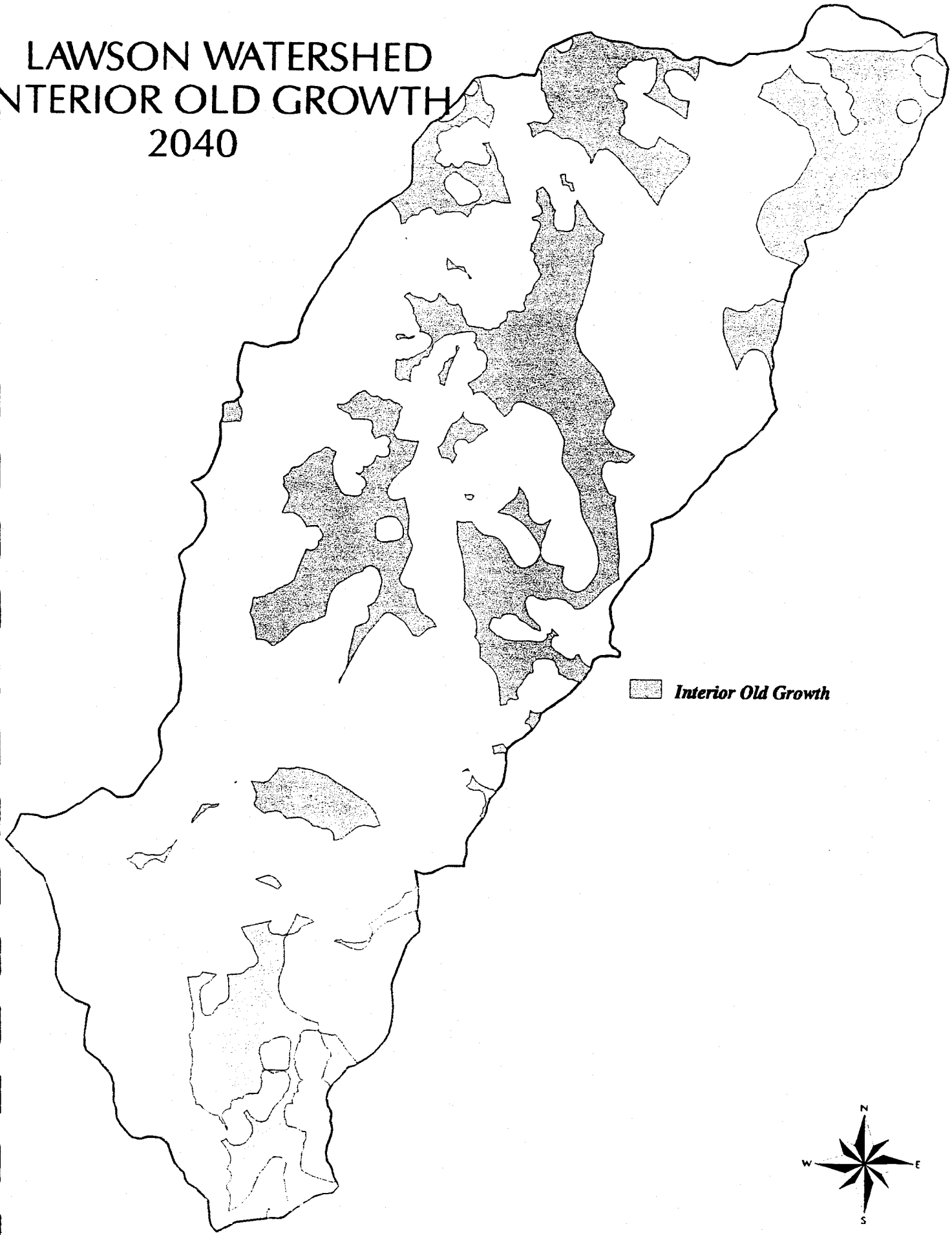
Figure 19

LAWSON WATERSHED INTERIOR OLD GROWTH 2040



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What are the special and unique habitats in the watershed and how are they changing?

During the past ten years a number of important but relatively small Special Wildlife Sites (Management Area 9) on the Forest have been identified as unique wildlife habitats and small botanical sites (Siskiyou LMRP, page IV-113). A total of 1,434 acres have been designated in the Lawson watershed (see Figure 20, Special Wildlife Sites Map). These sites constitute important components of overall wildlife habitat diversity and botanical values within the watershed.

Table 7. Special Wildlife Sites.

Type of Site	Acres
Botanical	119
Dispersed late-successional	214
Elk Areas	39
Lakes and Ponds	31
Meadows and Meadow Buffers	412
Rock Bluffs	102
Tanoak Areas	184
Wildlife Areas	333
Total	1434

The Siskiyou LMRP designated 559 acres of Botanical areas (Management Area 4) within the Lawson watershed. This includes portions of two Botanical sites:

Site Name	Approximate Acres
Snow Camp	539
Sourgame	20
Total	559

The Southwest Oregon LSR Assessment (Version 1.0, page 143) identified meadow and oak savanna habitat within the Late-Successional Reserves as important elements in habitat diversity. "Maintenance of these areas ensures this habitat continues to function and provide biological diversity. Though the maintenance of this habitat is contrary to late-successional conditions, the limited area, arrangement, and importance of this habitat-niche does not adversely impact the objectives of the late-successional reserves, and does improve ecosystem resilience by increasing diversity".

Analysis was completed comparing historical (1940) aerial photographs with current photographs and projecting trends into the future. Meadows provide habitat for some sensitive wildlife, including california mountain kingsnake, Leach's brodiaea and Bolander's onion.

Historic Meadow Conditions

Native Americans maintained meadows with burning and early settlers may have reduced conifer encroachment rates on these meadows with heavy grazing and burning. Natural fires may have also opened many ridgetop environments to meadow, or meadow-like conditions. Since the early 1900's, when fire suppression became effective in the watershed, the meadows have increasingly become overgrown with conifer tree species.

Brewer spruce (*Picea breweriana*) is found only in the Siskiyou Mountains of southwestern Oregon and northern California, and is the rarest North American (*Picea*). These spruce typically grow on dry to moist mountain ridges and peaks near timberline, and often under severe environmental conditions. It is a narrow endemic, presently occupying only a small portion of its former range.

The populations on Game Lake Peak and near Snow Camp Mountain are at the western edge of its present distribution. THere is also a population within the Big Craggies Botanical Area, approximately five miles to the south. The population on Iron Mountain, within the Iron Mountain Botanical Area, is at the northern edge its present distribution, located approximately twenty miles to the north.

Brewer spruce is also known as "weeping spruce" because of its long and pendulous branches. It has the thin scaled-flaky bark typical of spruces and is thus quite fire-sensitive. Its slow growth may lead to a large gap in age groups, and possible decline, if regeneration is not occurring. Vigorous natural regeneration is apparently typical of the species throughout its range.

Information Needs: Inventories of the meadows, oak savanna areas, and ponderosa pine plant series need to be completed to determine species composition, amount of encroachment, the best methods to restore these habitats, and the best methods to improve or restore native grasses and other species. Brewer spruce populations need to be assessed for hazardous fuels build-up. Verify that vigorous natural regeneration is occurring within the stands. Potential special and unique sites need to be surveyed to determine if they meet Management Area 9 (Special Wildlife Site) criteria.

Management Opportunities: For ponderosa pine plant series consider encroachment reduction through logging or fire and maintenance by periodic fire. Clear understory to allow regeneration if necessary. For Brewer spruce, medium to high-intensity fires should be avoided. Clear understory to allow regeneration if necessary.

There is an opportunity to return meadows to historic conditions. Returning to 1940 size would be a reasonable goal because there are accurate records of 1940 meadow conditions (aerial photographs) and the natural disturbance regime which maintains these sites since 1940 has been halted through fire prevention. Some specific projects include:

Sevenmile Meadow - This site has had a large amount of encroachment since 1940 and the encroachment is expected to continue. The encroaching trees may need to be removed or killed and left on site. Due to the small size of encroaching trees, a commercial entry would be more feasible in the year 2005. Fire could be returned to the meadow ecosystem. This meadow is moderately stocked with trees approximately 10 to 30 inches in diameter, creating an open stand.

Pebble Hill Meadows (MD-058), MD-272 and MD-273 have had encroachment, but not to the extent of Sevenmile Meadow. Some of this encroachment may need to be removed or killed and left on site. Fire could be returned to the meadow ecosystem. These meadows are lightly to moderately stocked with trees approximately 10 to 30 inches in diameter, creating an open stand/heavily stocked meadow.

Megs Meadow (MD-076) might be returned to its 1940 level with a small amount of tree removal or trees killed and left on site. Some work with the sediment that resulted from the culvert failure from road 3680.351 may improve the current condition.

Fairview Meadows (MD-074 and MD-075) and Wildhorse Meadow (MD-066) should be maintained at present sizes and further encroachment should be prevented. Fire should be returned to these meadow environments. Silviculture entry to adjoining habitat to Fairview and Wildhorse meadows to enhance the hiding cover or forage may be desirable.

Aerial photo analysis showed many meadows to be larger than current conditions. Many meadows were open with scattered trees. Sevenmile Meadow (MD-057), Pebble Hill Meadows (MD-058), MD-272 and MD-273 were open meadows with scattered trees. Megs Meadow (MD-076) was an open wet meadow. Fairview Meadows (MD-074 and MD-075), Wildhorse Meadow (MD-066), and MD-272 were open dry prairies.

Current Meadow Conditions

Aerial photo analysis showed many meadows are being encroached by trees. Many meadows that had been open with scattered trees now have a greater stocking of trees. Sevenmile Meadow (MD-057) has shown the most increase in stocking level of the four meadows with scattered trees. The other three, Pebble Hill Meadows (MD-058), MD-272 and MD-273, have had some encroachment. Megs Meadow (MD-076) has not had much encroachment, but a culvert failure on the 3680.351 caused much sediment to deposit on the meadow. Fairview Meadows (MD-074 and MD-075) and Wildhorse Meadow (MD-066) have had an extensive amount of encroachment into the historic meadow area. In addition, Fairview and Wildhorse meadows have had nearly all adjoining habitat removed by timber harvest. Very little wildlife hiding cover exists adjoining these meadows other than the meadow encroachment. MD-272, another open dry prairie, has had a small amount of encroachment.

Future Meadow Conditions

Unless management activities are implemented, meadows are projected to continue to decrease in size due to vegetative encroachment and lack of high intensity fire events.

Sevenmile Meadow (MD-057) is expected to increase in tree stocking level and canopy closure will increase. Pebble Hill Meadows (MD-058), MD-272 and MD-273, will continue to slowly be encroached by trees. Megs Meadow (MD-076) is not expected to change much due to the wet condition. The sediment deposited on the meadow during the culvert failure on the 3680.351 will slowly heal. The road was obliterated in 1995 and no further degradation is expected. Fairview Meadows (MD-074 and MD-075) and Wildhorse Meadow (MD-066) will continue to have tree encroachment into the historic meadow area. Adjoining habitat to Fairview and Wildhorse meadows will likely provide suitable hiding cover. MD-272, another open dry prairie, will likely have little change. The small amount of encroachment from 1940 to 1995 will continue to grow, shading out parts of the meadow, and further encroachment is likely.

Other Special Wildlife Sites

Existing lakes, ponds, springs, talus areas, rock outcrops with associated caves and cliffs are not expected to have changed from historic (1940) conditions. No further analysis of these habitat components will be completed. Wildlife associated with these habitats include red-legged frog, southern torrent salamander and western toad (lakes, ponds, springs), Del-Norte salamander (talus habitat), peregrine falcon, common raven, golden eagle, cliff swallow (cliff habitat), western fence lizard, western rattlesnake, ringtail, porcupine, and golden mantle ground squirrel (rock outcrops), and cave habitat for bats, bear, bobcat, cougar, and woodrat.

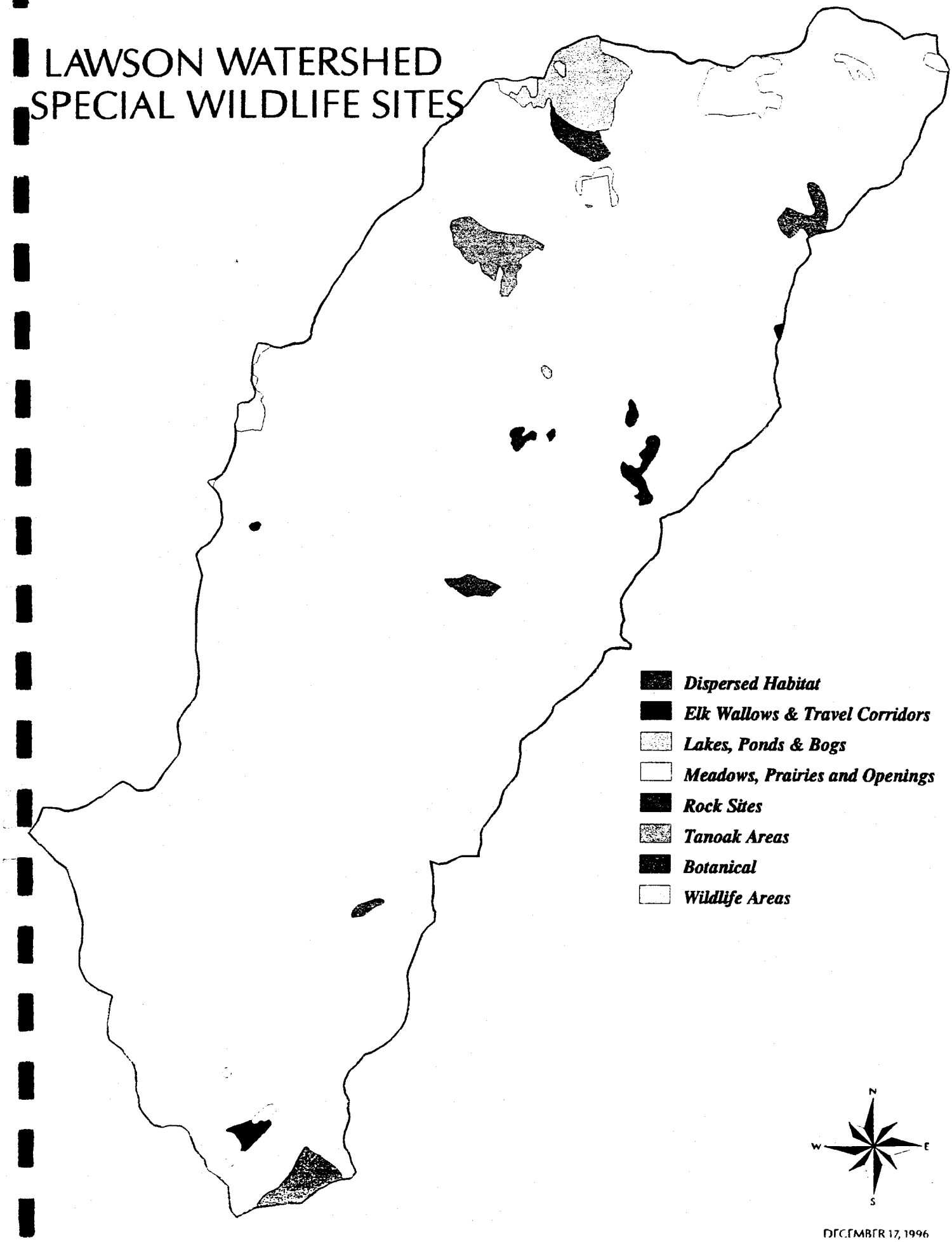
Unique Tree Species

Ponderosa pine and Brewers Spruce are both found in the watershed but are uncommon to the area. The Lawson and Shasta Costa watersheds provide an isolated western location for ponderosa pine in Oregon. Ponderosa pine and its habitat, most often an understory of oak and grass savanna, is at risk ot encroachment by Douglas-fir.

The ponderosa pine plant series occurs mostly in four areas, tow at the south end and two at the north end of the watershed. The Pine Grove trail accesses on eof the areas on the northwest edge of the watershed. Ponderosa pine habitat is less susceptible to encroachment on ultramafic (serpentine) soils. Verification on ponderosa pine versus Jeffrey pine should be done, especially on ultramafics. The Pine Grove Trail/Pebble Hill area likely contain both species, due to the influence of mudstones and ultramafics.

Figure 20

LAWSON WATERSHED SPECIAL WILDLIFE SITES



DECEMBER 17, 1996

What is the relative abundance and distribution of the species of concern in the watershed (e.g., threatened or endangered species, special status species, species emphasized in other plans)? What is the distribution and character of their habitats?

Proposed endangered, threatened and sensitive (PETS) species

The Siskiyou National Forest has four species listed as endangered or threatened under the Endangered Species Act: the peregrine falcon, bald eagle, northern spotted owl, and marbled murrelet. Peregrine falcons, which are classified as endangered, have not been reported in the watershed. Bald eagles have been sighted along Lawson Creek. There are no areas of high use and no nest sites are known or suspected in the watershed. Marbled murrelets, which are classified as threatened, have been determined to occupy one stand in the watershed. Northern spotted owls do nest in the watershed. The Lawson watershed contains a portion of the median home range (1.3-mile radius around a nest or activity center) of 6 spotted owl pairs or likely pairs (USDI Fish and Wildlife Service, dated April 10, 1991). Of the 6 pairs, 5 activity centers are in the Lawson drainage and one additional activity center has a portion of its home range within the Lawson watershed.

The ROD designated 67 percent of the watershed to be managed towards a late-successional habitat condition (Management Areas 1-8). The area designated as Late-Successional Reserve in the Lawson watershed, contains the activity centers of the 5 owl pairs in the watershed. The viability of owls should remain stable. See indicator species section below.

All occupied habitat for marbled murrelet is protected under a Late-Successional Reserve. The viability of murrelets within the Lawson basin should remain stable. The Wildhorse Ridge area seems to be the eastern limit of marbled murrelets on the Gold Beach Ranger District.

There will continue to be little contribution to the viability of bald eagles and peregrine falcons from the Lawson drainage.

Sensitive Species

Animal - Del Norte salamander, California mountain kingsnake and western pond turtle are documented to be present in the watershed. Riparian areas in the watershed provide potential habitat for white-footed voles. There are no known Townsend's big-eared bats in the watershed. There is suitable red-legged frog habitat in the watershed, but none have been documented. Wolverine have not been sighted in the area, but potentially suitable habitat, high elevations, and remoteness are present. If wolverines exist on the Siskiyou National Forest, the Lawson watershed has a relatively high likelihood of use.

Plants - *Triteleia hendersonii var. leachiae* (Leach's brodiaea), *Allium bolanderi* (Bolander's onion), *Hieraceum bolanderi* (Bolander's hawkweed), *Poa piperi* (Piper's bluegrass), *Carex gigas* (Siskiyou sedge), *Bensoniella oregona* (Bensonia), *Erythronium howellii* (Howell's fawn-lily), *Lupinus tracyi* (Tracy's lupine), and *Sidalcea malvaeflora* ssp. *patula* (Coast Checkermallow) have been documented in the watershed.

Neotropical Migratory Birds

The large blocks of relatively unfragmented blocks of habitat within the Lawson watershed provide good nesting sites for birds, such as the willow flycatcher, that are particularly vulnerable to parasitism by brown-headed cowbirds. Cowbirds, edge specialists, are not known in the Lawson drainage. Cowbirds are also particularly attracted to human habitation and cattle, neither of which occur in the watershed.

Woodpeckers are dependent upon snags and down wood for roosting, nesting, and foraging habitat. High intensity fires killed large conifers and hardwoods. The variation in amounts left after fires is not known. There were areas shown on 1940 aerial photos, where large brushfields did not contain visible large snags. These were mainly found in areas that likely had frequent fires, i.e. placed high up on ridges on south facing slopes. Smaller snags were created in stand development where competition between densely spaced trees and brush caused mortality.

Only 15 percent of the area in the watershed has been managed leaving 85 percent in a near natural condition for snag habitat. The exclusion of fire may have had an effect, but this effect is difficult to quantify. There does not appear to be any threat to the viability to this group of indicator species, therefore no additional analysis will be undertaken in this iteration of the watershed analysis. Snag and downed wood data were collected in stand exams in Lawson. This information could be incorporated into the watershed analysis during a future iteration.

Deer and Elk

Elk and deer use all successional stages to meet their habitat needs for cover, forage, and reproduction. Natural or created openings provide the majority of the feeding habitat, which is assumed to be the most restrictive habitat component in this region (Forest Plan FEIS, Chapter III-Affected Environment pages III-106 through III-107). Elk and deer represent more than 180 wildlife species that need young successional stages to meet all or some of their requirements (Guenther and Kucera 1978, Brown 1985).

There are three elk herds which utilize portions of the Lawson Watershed. On Wildhorse Ridge, a small herd of nine animals exists. Another herd of twelve elk reside in the Fairview meadow area. On the east side of the watershed near Game Lake, approximately 25 elk are present. Forage habitat consists of natural meadows (Wildhorse, Sevenmile, etc.), serpentine meadows and timber harvest areas.

Deer are found throughout the watershed, though an accurate estimate of their population is unavailable. Deer use newly harvested areas and natural meadows for foraging. They also feed on acorns from oak trees throughout the area and use the riparian areas during fawning season and summer. Wildhorse Prairie, Fairview Meadow and the area around Meg's Meadow are most heavily used by deer and elk.

To estimate the amount of deer and elk habitat, the amount and quality of forage and cover was analyzed. GIS was used to analyze seral stages at the stand level. Tables 9 to 11 list the acres of each type of habitat estimated for the Lawson watershed. Table 11, elk habitat in 2040 assumes that no harvest would take place. If harvest does occur, there will be an increase in the forage habitat type and a decrease in optimal and thermal cover habitat type. The exact acreages of each type can not be determined at this time.

Table 9. Elk Habitat Type in 1940

Habitat Type	Acres	Percent of Watershed
Optimal Cover	2,261	9
Thermal Cover	14,705	58
Hiding Cover	6,954	28
Forage	1,320	5

Table 10. Elk Habitat Type in 1993

Habitat Type	Acres	Percent of Watershed
Optimal Cover	3,343	13
Thermal Cover	11,537	46
Hiding Cover	7,020	28
Forage	3,340	13

Indicator Species

Bald Eagle and Osprey

Bald Eagle and Osprey utilize habitat corridors along major rivers, sometimes nesting up to one mile (occasionally further) from rivers in large green trees or dead trees. Existing bald eagle and osprey sighting data in the Lawson watershed was reviewed and there are no nests located in the watershed. As a result, the contribution of the Lawson watershed to the viability of bald eagle and osprey is determined to be insignificant.

Spotted Owl, Pileated Woodpecker, and American (Pine) Marten

The northern spotted owl represents over 150 other wildlife species which use late-successional forest habitat for all or part of their life cycles (Guenther and Kucera, 1978, Brown, 1985). Spotted owls are strongly associated with dense mature and old-growth Douglas-fir forests. These habitats provide the structural characteristics required by the owls for food, cover, nest sites, and protection from weather and predation. Pileated woodpeckers and pine marten represent the composite needs of over 160 wildlife species which utilize mature forest (Guenther and Kucera 1978, Brown 1985). The Siskiyou LRMP had designated areas for the pileated woodpecker and pine marten within Lawson (Management Area 8, Forest Plan, Chapter IV-Forest Management Direction, page IV-105). However, the ROD ammended MA-8, and created Late-Successional Reserves which account for these species and the species they represent.

Existing sighting data from the Wildlife Observation (WILDOBS) database was analyzed. The geographical information system (GIS) was used to analyze stand level vegetation data to calculate historical, existing, and future levels of habitat for these species (Table 8). Mature and old-growth seral stages were used for pileated woodpecker and marten habitat. For the spotted owl analysis, mature and old-growth seral stages on ultramafic soil types were not included. Land allocated as matrix was not included in these percentages, assuming that some day these lands would be harvested.

Table 8. Spotted Owl, Pileated Woodpecker and Pine Marten Habitat

	Spotted Owl Habitat		Pileated Woodpecker/Marten Habitat	
Year	Acres	Percent Watershed	Acres	Percent Watershed
1940	9,201	36 percent	11,725	47 percent
1993	11,918	47 percent	17,431	69 percent
2040	12,995	51 percent	18,308	73 percent

There is no historical information for species use in 1940. Spotted owls have been documented in Lawson watershed (see PETS section for more details). Both pileated woodpeckers and marten have been documented in the Lawson watershed. The future in the Lawson watershed looks bright for these indicator species and the species they represent as habitat continues to increase.

Woodpeckers

The composite snag needs of woodpeckers represent all wildlife species that use cavities for nesting or denning (Siskiyou LRMP FEIS, pages III-104, III-105). On the Forest, and most likely in Lawson, there are over 75 species which use snag habitat (Guenther and Kucera 1978, Brown 1985). Siskiyou Forest Standard and Guideline 4-13a states that habitat capability of woodpeckers should be continually maintained in areas managed for timber production at not less than 60 percent of potential population levels. In Later-Successional Reserves, woodpecker habitat capability should be 100 percent of potential population levels.

What are the locations and risk of spread for noxious weeds in the watershed?

Noxious Weed Information

Five noxious weed species currently inhabit the watershed and two occur in neighboring watersheds. Noxious weed populations have increased as the road mileage in the watershed has increased. Most populations are currently restricted to areas that have been disturbed through natural or human-caused events. These include roadsides, disturbed woodlands, landing sites, and streambeds.

Two species exist (scotch broom and gorse) in low enough numbers that treatment can limit or expatriate their populations (see Figure 21, Noxious Weed Location Map). French broom occurs nearby and may be found somewhere in the watershed soon. Its populations can be controlled if it is detected early. Yellow star thistle and meadow knapweed, although not currently present, should be monitored. Early detection of these problem weeds could save much time and effort in eradication.

Scotch broom and gorse are beginning to appear in the Lawson watershed and their aggressive nature threatens to destroy native plant communities. Gorse and broom may become safety hazards. Gorse has dangerous thorns and both can become fire hazards. The most serious weed threat in the watershed occurs at milepost 21 on road 3680. At this site, a large scotch broom colony at multiple locations, is growing on serpentine soils along a frequently used road. Currently all large plants have been mechanically removed, but the site requires frequent monitoring to eliminate the many seedlings which will continue to germinate. Scotch broom also occurs on the 3318 road system at several location: near Wildhorse Lookout and on road 3318.130.

Gorse occurs at multiple locations in the watershed. As of Fall, 1996, there are no known sites with live plants, although these sites will need monitoring for seedling germination. Gorse seeds lie dormant in the soil and new plants may regerminate for many years if seeds have built up in the soil. Gorse sites exist on road 3680.402, along 3318 near Wildhorse Prairie, at the landing at the end of 3318.240, and near road 3318.222.

Canada thistle, bull thistle, and tansy ragwort are established in the watershed and pose a lesser threat because they have already long occupied many of the watershed's disturbed sites. Biological controls, including a flea beetle and the cinnabar moth, have been established to keep tansy ragwort under control. Soon a biocontrol may be available for Canada Thistle.

Management Opportunities:Treatment of infested areas is needed to reduce, control and/or eliminate the further spread of these plants in the watershed. It will be necessary to survey disturbed areas to detect new populations of noxious weeds before they become well-established. Treatment opportunities include cutting, pulling, or burning noxious weeds, closing roads, cleaning construction machinery before moving onto National Forest lands and before leaving infested sites, using only "clean" fill material, and using only certified weed-free hay. Seeding disturbed areas with native plant species will reduce opportunities for weeds to become established, and biological controls may be necessary to control widely distributed weed populations. Follow-up surveys of treated sites will be necessary to detect noxious weed population regeneration. Before ripping roads in contaminated areas, it should be determined if doing so would encourage noxious weeds to take over the disturbed sites.

Table 11. Elk Habitat Type in 2040

Habitat Type	Acres	Percent of Watershed
Optimal Cover	5,050	20
Thermal Cover	11,548	46
Hiding Cover	7,070	28
Forage	1,572	6

Data from GIS was converted to SNAP for the current seral stage. Due to time constraints, the following analysis was not completed for historic or future conditions. Existing conditions for elk habitat was evaluated using a model developed for use in Western Oregon. The model was based on the interactions of four variables: (1) size and spacing of forage and cover, (2) road density, (3) cover quality, and (4) forage quality (Wisdom et. al., 1986). Optimal cover modifies ambient climate, allows escape from human harassment, and provides forage. Thermal cover functions similarly to optimal cover, but it does not provide forage. Hiding cover allows elk to escape human disturbances (Wisdom et. al., 1986). The quality of forage is as important as the amount of forage available. Human disturbance allowed by motor vehicle access reduces elk use of habitat adjacent to roads (Wisdom et. al., 1986).

The elk habitat effectiveness model gave a score of 0.47 on a scale of 0 to 1.00, with 1.00 being optimal. A score of 0.47 indicates that the habitat present in the Lawson area is capable of supporting a viable population of elk. The four component values were: sizing and spacing of forage and cover areas, 0.77; density of roads open to motorized vehicles, 0.52; cover quality, 0.80; and forage quality, 0.15. The lowest value was forage quality, and therefore the most restrictive habitat component. This is due in part to the low number of acres of high quality forage, i.e. meadow habitat.

Currently the Lawson Watershed does not meet LRMP 4-11 which requires that 20 percent of the watershed should be maintained in forage areas. Lawson Watershed currently has approximately 13 percent of the area rated as forage with a predicted 6 percent in the year 2040. About 3 percent of the forage in the Lawson basin is on ultramafic (serpentine) areas which provides only low quality forage. Less than 1 percent of the forage areas occurs in meadows with the remaining occurring in harvest areas. As a requirement under NFMA, 219.19, the Siskiyou National Forest, Forest Plan FEIS, p. III-102, designated elk and deer as indicator species in the Siskiyou National Forest Forest Plan FEIS. Deer and elk were selected because they are commonly hunted and they represent other species that utilize early successional forest. There are more than 180 wildlife species that need young successional stages to meet all or some of their requirements (Brown, 1985). NFMA, 219.19 states, "In order to insure that viable populations will be maintained, habitat must be provided to support, at least a minimum number of reproductive individuals and that habitat must be well distributed so that those individuals can interact with others in the planning area." Populations of wildlife species that are associated with this habitat type will decrease.

Information Needs: Pacific Meridian Research (PMR) vegetation data needs to be ground verified to ensure validity. The correlation between certain vegetation types, seral stages and wildlife use of those habitats needs to be verified. This can be completed by continuing to do surveys for presence of indicator and PETS species.

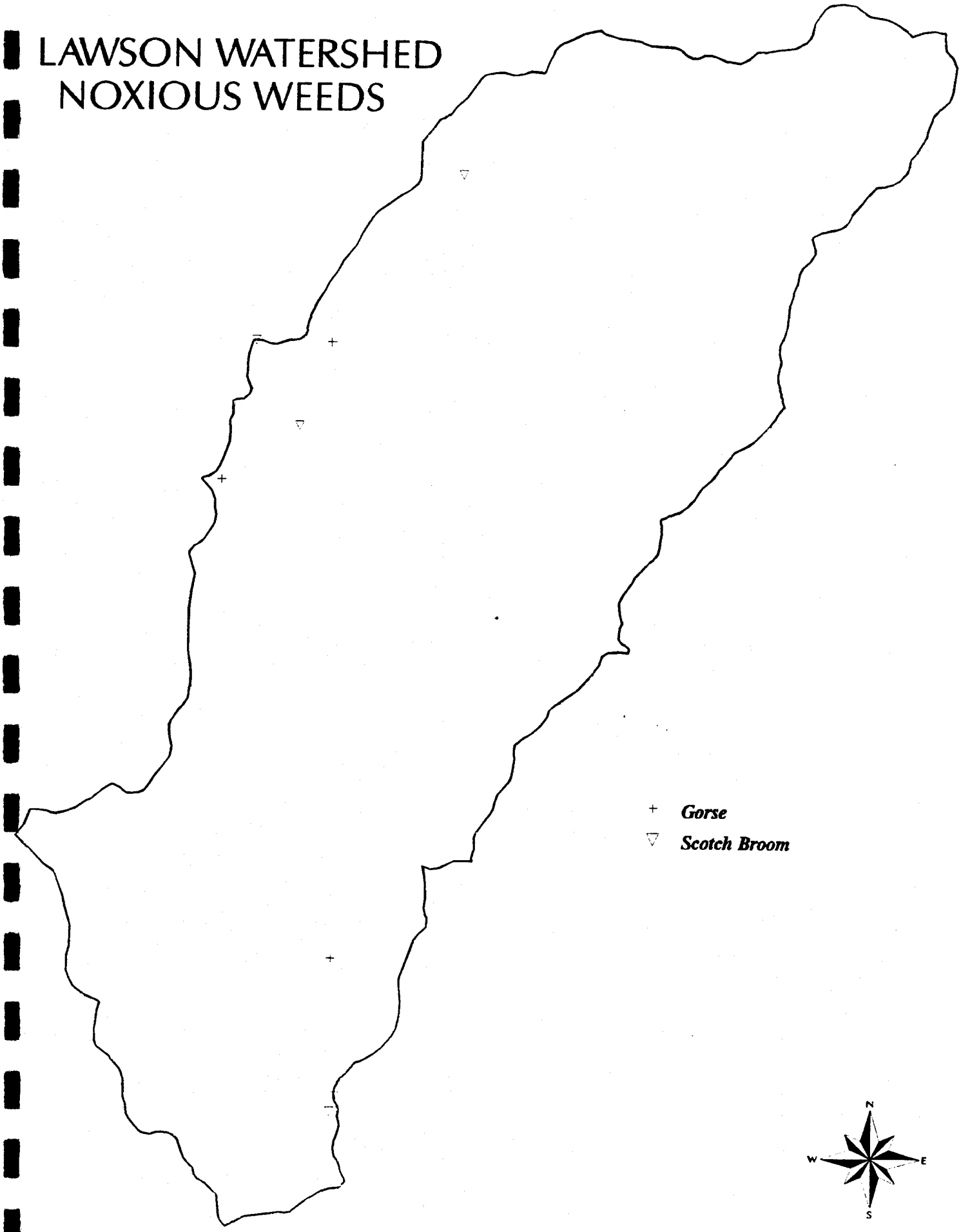
Management Opportunities: Woodpecker habitat can be improved by managing for snags. Retain existing snags in the watershed, except those that are hazardous along roads, where possible. Protect snag pockets during management activities and create snags where needed to meet the Siskiyou LRMP as amended by the ROD.

Forage seeding could be used where timber harvest occurs to enhance the forage value for elk. Roads could be closed to motorized travel to improve the road density value for elk. Encroaching trees in open meadows and oak savanna areas can be cut and removed or girdled (see special wildlife site section). These habitat types can be burned to remove encroachment and benefit native species. Areas of exposed soil can be seeded with native species.

A potential specific project is to create some quality forage/early successional habitat within immature and mature stands by thinning to a wide spacing, creating 1 to 2 acre openings, underburning, and seeding with native species.

Figure 21

LAWSON WATERSHED NOXIOUS WEEDS



DECEMBER 17, 1996

What are the locations and risk of spread of *Phytophthora lateralis* (Port-Orford-cedar root disease) in the watershed?

Role of Port-Orford-cedar in the watershed.

Port-Orford-cedar is a component of timber stands in approximately 56 percent (14,200 acres) of the watershed (see Figure 22, Port-Orford-cedar Map). Port-Orford-cedar provides shade, large wood, and vegetative diversity. It often acts as a co-dominant with Douglas-fir in riparian areas, especially on the western half of the watershed. It is often the dominant tree in ultramafic riparian areas, especially on the eastern half. It can also be an important source of large wood and vegetative diversity in upland sites.

Port-Orford-cedar can be both a pioneer and a climax species in the same stand. It retains the ability to respond after dominants die. Port-Orford-cedar reproduces more effectively in shade than associated conifers, except for western hemlock and sometimes white fir. In old stands, Port-Orford-cedar seems as tolerant of fire as Douglas fir. Older trees develop thick bark and survive large, deep, fire scars. The wood has a high resistance to decay and insects. It can be especially valuable as riparian large wood, remaining in streams longer than equal-sized logs of associated species. It can also have lesser value for cavity-nesters due to its decay resistance.

Port-Orford-cedar boughs are collected commercially for floral arrangements and the timber has a high value. The upper North Fork area, along the first mile of road 3318.310, has been the most popular bough collection site. Port-Orford-cedar brings higher prices than almost any other conifer in the United States due to log export to Japan. Helicopter harvest of Port-Orford-cedar began in the South Fork in 1970. Helicopter harvest of live and diseased Port-Orford-cedar continued until 1990 in the North and South Forks.

Effects of Port-Orford-cedar root disease (*Phytophthora lateralis*) on the watershed .

About 25 percent (3500 acres) of the area in which Port-Orford-cedar is a stand component, has some occurrence of root disease. Most of the spread occurred with introduction to the North and South Forks in the 1970's. Currently, Port-Orford-cedar root disease is still spreading but at a slower rate. The watershed, along with the adjacent Collier Creek and Windy Creek watersheds, is relatively undiseased in comparison to Port-Orford-cedar areas north of the Rogue River to Coos Bay.

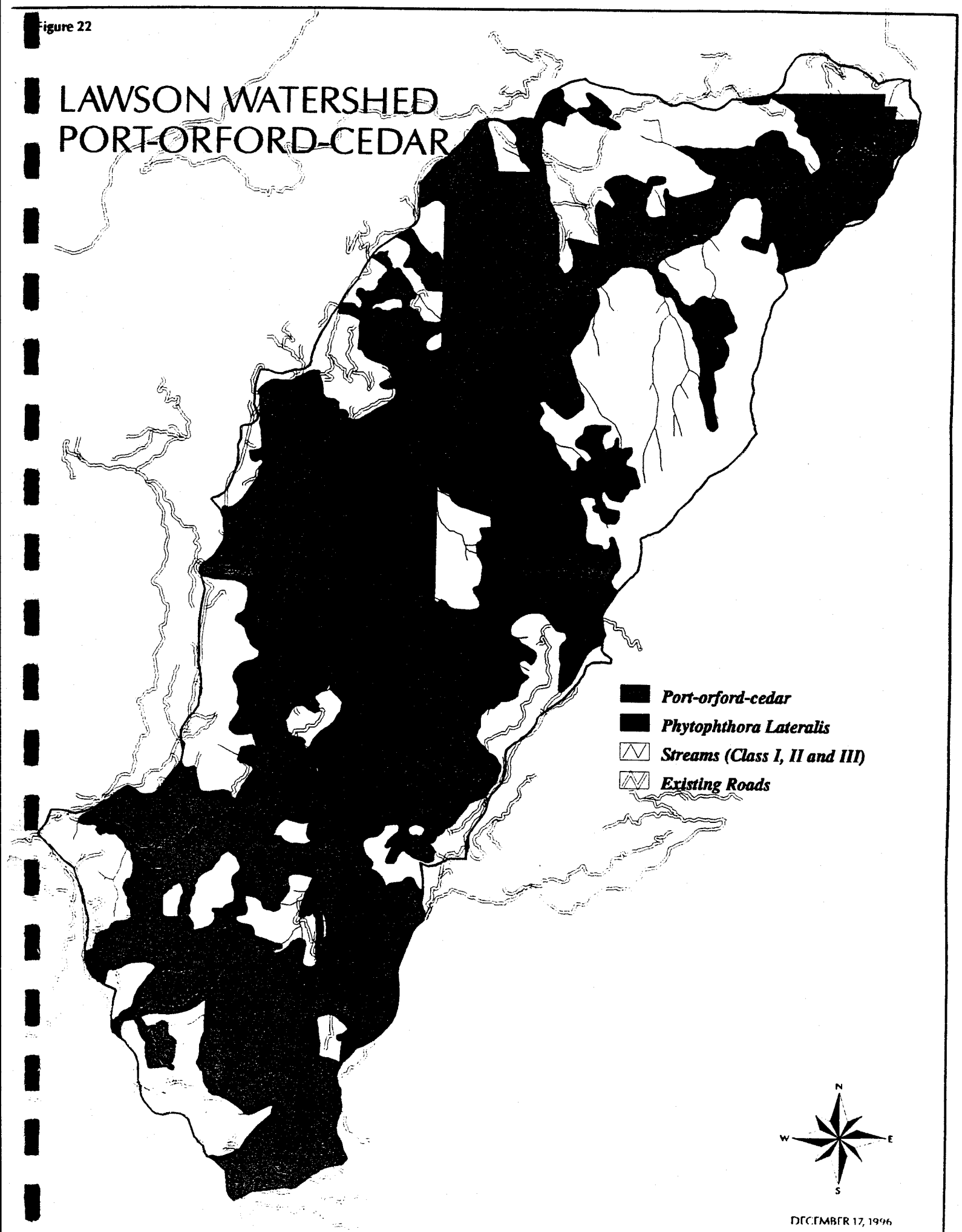
In areas infested by root disease the function of Port-Orford-cedar along riparian areas has been diminished. The snags are potential large wood but some stream shading has been lost. Individual trees and clumps of Port-Orford-cedar have been killed by the disease. Mortality is generally under 30 percent except for flat sites where spores are more effective. Scattered Pacific yew in the North Fork have also been killed by the disease. Aggressive reproduction and natural restrictions on the root disease (fast-flowing streams, sites away from roads) indicate that survival as a species is not threatened.

Root disease zoospores are mobile in water. Disease spore are long-lived in organic soil. One introduction of the root disease may spread to riparian stands in the watershed below. Natural uphill spread of root disease is slow.

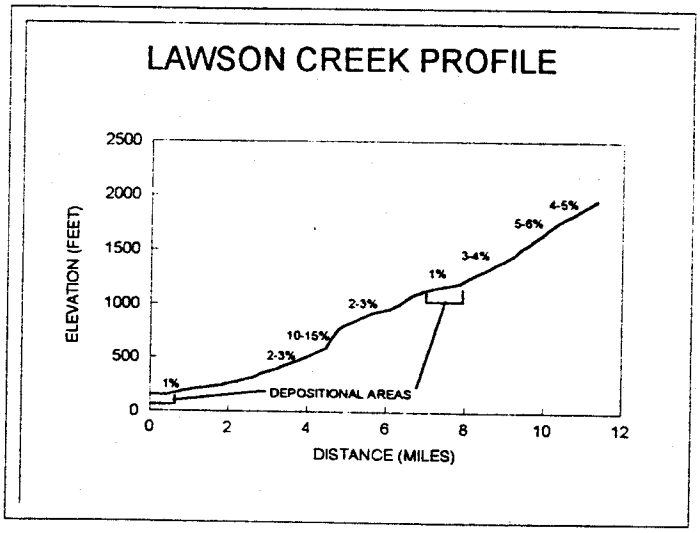
A programmatic strategy of sanitation removal of Port-Orford-cedar from main roads, and closure of critical spur roads, is under implementation. Pre-project washing of equipment and dry season operation are the preferred project-level control measures.

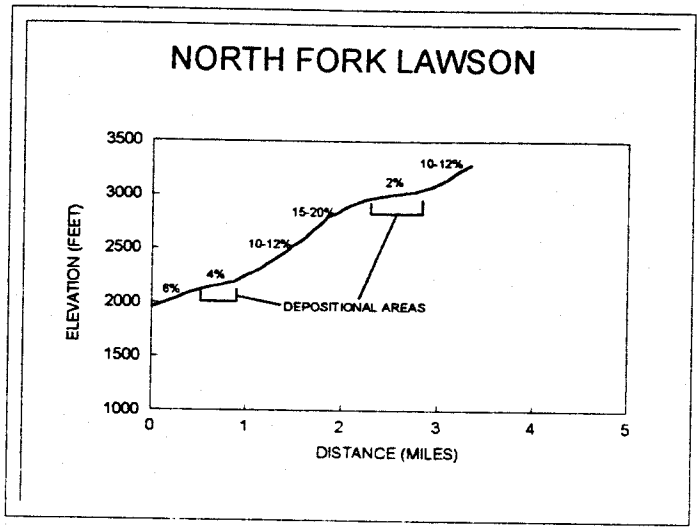
Figure 22

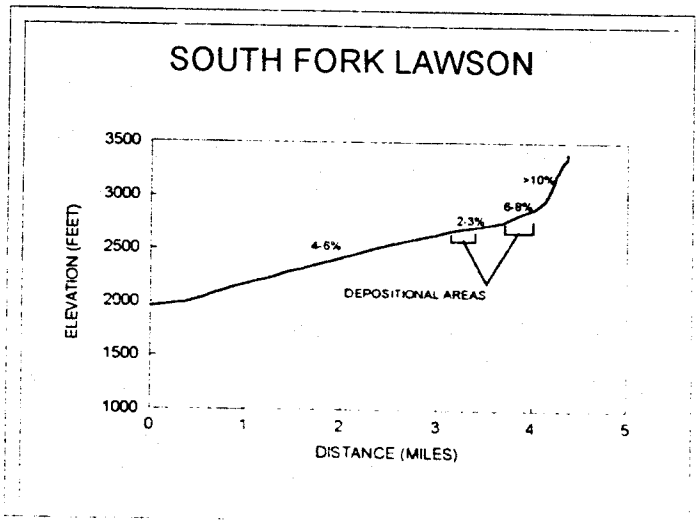
LAWSON WATERSHED
PORT-ORFORD-CEDAR



DECEMBER 17, 1996

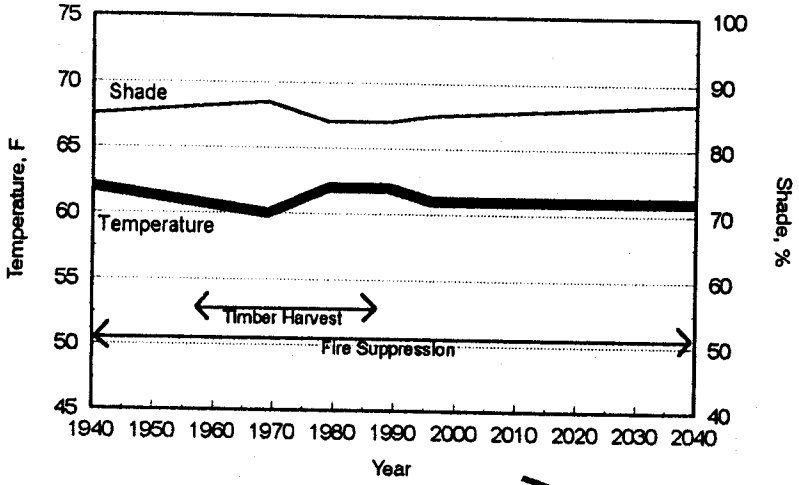

LAWSON CREEK PROFILE
ELEVATION (FEET)
2500
2000
1500
1000
500
0
1%
2-3%
10-15%
2-3%
1%
3-4%
5-6%
4-5%
DEPOSITIONAL AREAS
0
2
4
6
8
10
12
DISTANCE (MILES)


NORTH FORK LAWSON
ELEVATION (FEET)
3500
3000
2500
2000
1500
1000
6%
4%
10-12%
15-20%
2%
10-12%
DEPOSITIONAL AREAS
0
1
2
3
4
5
DISTANCE (MILES)

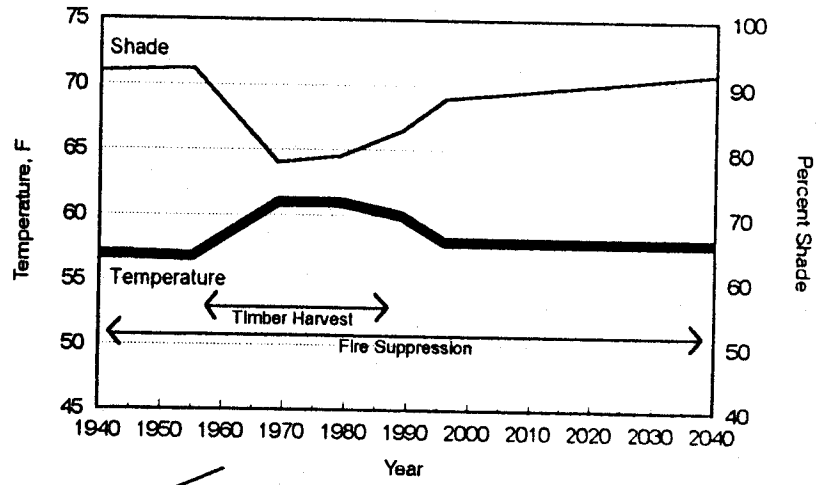

SOUTH FORK LAWSON
ELEVATION (FEET)
3500
3000
2500
2000
1500
1000
4-6%
2-3%
6-8%
>10%
DEPOSITIONAL AREAS
0
1
2
3
4
5
DISTANCE (MILES)

Lawson Creek

South Fork

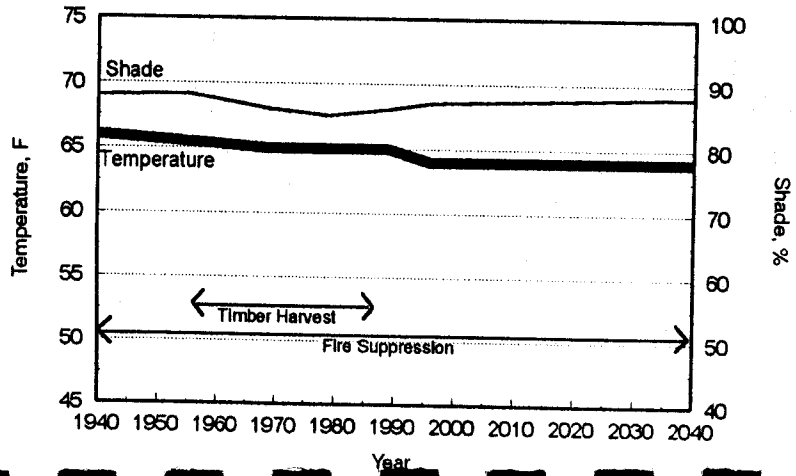


North Fork



Line width represents proportion of streamflow

Mainstem at Section 16 (Mile 7.3)



Risk of disease spread.

In comparison to watersheds to the north, there are several reasons for less disease in Lawson. There is less intensive heavy equipment activity; there is distance from major disease centers on the north side of the Rogue River; and a fair portion of the watershed is closed by snow in the wet season.

Most past spread, and future risk, lies in intensive activity such as unwashed heavy equipment operation in the wet season. General road traffic can also introduce the disease over long distances. Mud has been observed to stay on vehicles for trips over 30 miles, including trips on 15 miles of four-wheel drive road (Forbes 1993). The highest risk of spread by general road traffic is during the fall rainy season. Hunting and collection of special forest products, including mushrooms, occurs during this time. People involved in these activities often use four-wheel-drive vehicles that can carry mud which transports the disease.

The twelve highest-risk roads have been treated with sanitation removal of Port-Orford-cedar less than 8 inches diameter (by far the most common roadside Port-Orford-cedar) and/or wet season closure. Closure break-ins are not frequent after earth barriers were placed, but some have still occurred (Road 3318.280). Most are during hunting season, though some may be related to bough theft or mushroom picking

Illegal bough harvest has been noticed, in one case behind a closure barrier. Illegal bough picking is thought to be the most common cause of spread on the Smith River National Recreation Area to the south. Law enforcement is monitoring for illegal harvest.

Roadside disease sources exist just outside the watershed, north of Fairview Mountain on road 3680, north of the five corners junction along road 3318 (110 road), at Game Lake, and within the watershed along road 3318.310 and 3680.400 (before Huntley Springs).

Consequences of disease introduction could be high below roads on the eastern half (3680, etc.), as uninfected Port-Orford-cedar provides a higher percentage of shade and habitat in streams on ultramafic sites downstream. This condition also occurs in patches below road 3680.310 on the western half (see Table 12. Risk Rating for Roads in the Lawson Watershed).

Use of heavily infested water sources (Fry Place, Lawson Creek, Saddle Mountain, Game Lake) should be avoided. Effectiveness of chlorine is uncertain, especially when muddy water is drafted (chlorine adheres to particles, and cannot kill any drafted resting spores). Encysting of spores through pump drafting turbulence may limit viability of zoospores, but high spore levels at heavily infested sites increase chance of viability.

The use of existing uninfested sources, although spread far apart, is considered workable for engineering and fire resources. Partially infested sources near uninfested stands, such as Hardrock (3680.352) and Wildhorse (3318.190), are currently avoided. Sanitation, or alternate source development, is being considered to reduce long-term costs (See Table 13. Risk Rating of Water Sources in the Lawson Watershed).

Table 12. Risk Rating for Roads in the Lawson Watershed.

Road Number	Risk Rating	Risk Ranking	Miles of Stream	Percent POC
1376	High	1	18.0	0-40 (Primarily Windy Creek, Collier - 1 mile of stream in Lawson)
3680 (all)	High	2	5.0	0-40
3680.401	High	3	3.0	0-40 (Primarily Collier - half mile of stream in Lawson)
3318.240,248	High	4	2.5	0-40
3318.202	High	5	2.5	0-20
3318.310 (all)	High	6	2.0	0-20
3318.314	High	7	1.0	0-20
3680.408,491	High	8	1.5	0-5
3680.351 (Obliterat-ed)	Moderate	9	1.0	0-20
3318.280,281,282	Moderate	10	1.0	0-20
3318	Moderate	11	1.5	0-5
3680.402	Moderate	12	0.2	0-20 Risk of export
3680.350, 352, 356, 357, 358	Moderate	13	0.2	0-20 Risk of export
3680.407	Moderate	14	2.5	0-5 POC beyond end
3680.380	Moderate	15	0.2	0-20
3680.390	Moderate	16	0.2	0-20
3318.312	Moderate	17	0.5	0-20
3680 L,N,F, spurs	Moderate	18	0.5	0-5
3680.351 D,E,F,G spurs	Moderate	19	0.5	0-5
3318.130	Moderate	20	0.5	0-20
3318.180,181	Moderate	21	0.5	0-20
3318.190,191	Moderate	22	0.5	0-20
3318.195,196	Moderate	23	0.5	0-20
3318.210	Moderate	24	0.5	0-20
3680.410	Moderate	25	0.5	0-20
3680.495,497	Moderate	26	0.5	0-20
3318.122	Low	27	0.2	0-5
3318.120	Low	28	0.2	0-5

Table 12. Risk Rating for Roads in the Lawson Watershed, continued

Road Number	Risk Rating	Risk Ranking	Miles of Stream	Percent POC
3318.200,260	Low	29	0.2	0-5
3318.250,253	Low	30	0.2	0-5
3680.320,325	Low	31	0.2	0-5
3680.330	Low	32	0.2	0-5
3680.403	Low	33	0.2	0-5
3680.409	Low	34	0.2	0-5
3680.411	Low	35	0.2	0-5

Table 13. Risk rating of Water Sources in the Lawson Watershed

Area	Road Number	No POC	Percent POC	Uninfested	Low Percent POC and Disease	High Percent Disease
Fry Place	3318.122		5-20			X
Chicken Foot	3318.130		5-20		X	
Wildhorse (Quos.)	3318.190		5-20		X	
Lawson Creek	3318.310		5-20			X
Hardrock	3318.352		5-20		X	
Fairview	3318.350		0-5		X	
Huntley Spring	3680.400		20-40		X	
Saddle Mountain	3680.402		5-20			X
Lawson Saddle	3680.407		0-5		X	
Game Lake	3680.400		5-20			X

Information needs: Monitor the main uninfected creeks for disease on a periodic basis. Forest GIS mapping updates for Port-Orford-cedar are scheduled every five years. Creeks monitored should include those below Road 3318.240, and the end of Road 3680.407. This helps establish priority areas for disease control. Monitor effectiveness of sanitation as control measure (coordinate with Southwest Oregon area pathologist), and fire (road 3680.423) as eradication measure.

Management opportunities: Continue sanitation, closures, fire eradication, and maintenance. Clean equipment before operations. Restrict uses to dry season. Use uninfested water in firefighting, other activities. Place lift of rock on scattered infested road sites. Plant resistant/general stock at low-risk riparian sites.

What are the locations and risk of spread of five-needle pine (western white pine, sugar pine) blister rust in the watershed?

Role of five-needle pine in the watershed: Western white pine is a dominant overstory tree in much of the southeast portion of the watershed. It often occurs on upslope ultramafic sites along with Jeffrey pine, with Port-Orford-cedar dominating the riparian sites. Sugar pine occurs much less frequently as a minor stand component on a variety of soil types. The large seeds of the five-needle pine provide food for certain birds and small mammals.

Effects of blister rust disease on the watershed: Blister rust is an introduced disease associated with these five-needle pines. The disease occurs in higher quantities in Lawson than in adjacent watersheds. The disease is most extensive at sites that collect high amounts of summer fog, in this case mainly ridgetops. The upper Snow Camp Botanical area contains numerous dead western white pine, and may be one of the worst blister rust sites in the state (on-site conversation with Everett Hansen, forest pathologist, Oregon State University). High stand density in pine sites is increasing the risk of stress and introduction of blister rust and bark beetles. Bark beetles are more prevalent in sugar pine. The combination of blister rust and Port-Orford-cedar root disease may alter the composition of plant communities in some of hte watershed's ultramafic sites.

Risk of disease spread: The severe infestations of blister rust have likely already occurred in the most prone areas, such as upper Snow Camp Botanical area and Collier Ridge. Spread will likely continue at a slower rate through individual trees. However, dense stands with five-needle pine will be more susceptible to disease spread unless density is reduced. Risk reduction efforts can focus on planting resistant stock in heavily diseased sites and reducing density around pines.

Information Needs: Identify any severe blister rust areas or dense stands with five-needled pine other than Snow Camp Mountain, Collier Ridge, and upper South Fork or North Fork areas. Consider planting resistant seedlings where appropriate.

Management Opportunities: Reduce stand density and brush competition through thinning and prescribed fire. Plant resistant stock and evaluate planting resistant stock in the botanical area.

What is the fire history of the Lawson Creek watershed and what is the future role of fire in the watershed?

Fire History

The Lawson watershed, like most others of the Klamath Province, has been influenced by the effects of fire over time. Studies of disturbance in the Klamath province suggest fire was the dominant disturbance in over 60 percent of the areas sampled (Atzet and Martin 1991). Although difficult to accurately determine, the fire return frequency for the Lawson watershed is estimated to be 50 to 90 years which is similar to adjacent areas.

During pre-historic times and up to the early part of this century, weather and natural terrain features were the only factors that affected the spread of wildfire. Native Americans used fire to enhance forage for game which they hunted, and to stimulate the growth of plant species used both for food and to make baskets. It is likely open meadows were maintained through repeated burning by Native Americans and early settlers. Tanoak stands probably received similar treatments. In the Lawson watershed, it appears Wildhorse Ridge and perhaps the lower reaches of Lawson Creek were a primary focus for this treatment.

A major fire event was reported by sailors off the Southern Oregon coast in 1864. Although not supported by solid documentation, this fire was said to be of a gigantic magnitude, reaching from the California border to north of the mouth of the Rogue River. The origin of several stands within the watershed date back to this time.

Recorded fire history documents two major fires burning approximately 2500 acres or 10 percent of the drainage, around 1917. Both of these fires were determined to be human-caused. These fires appeared to have burned at various intensities, ranging from low intensity ground fires which killed very few of the larger trees to high intensity fires which constituted a stand replacement event. Approximately 40 percent of the area burned at high intensity, 25 percent burned with a low intensity, and the remaining 35 percent burned at moderate intensity.

Since 1917, there have been twelve lightning fires, six human-caused fires, and seven fires of unknown origin. All were suppressed at very small sizes. One other aspect of recorded fire events was the use of prescribed fire for slash disposal in managed stands. This activity occurred on approximately 12 percent (2933 acres) of the Lawson watershed.

Up until the 1920's and 30's most fires were simply monitored, as effective fire suppression resources and tactics did not exist. From this time forward, fire suppression capabilities have become more effective and fire suppression policies mandated all fires be controlled. Direction for wildfires today is contained in the Siskiyou LRMP as amended by the Record of Decision, April 1994. The Siskiyou LMRP states, pre-planned suppression strategies and acre objectives are set to control fires at 30 acres or less, 90 percent of the time. It is desirable to control any fire of moderate to high intensity. The standards and guidelines for Late-Successional Reserves (ROD 1994) emphasize the prevention of loss due to large scale fires, particularly stand-resetting disturbances.

As a result of the fire suppression, the majority of stands in the watershed have evolved for the past half century or longer without fire being a part of the forest disturbance regime. The only use of prescribed fire in the watershed has been slash treatments applied to harvested areas. Overall, fuels have been accumulating on the forest floor; areas that were historically or pre-historically burned for human needs have become encroached upon by surrounding vegetation; and unique native plant species, dependent on the return of fire, are receiving competition from non-native and sometimes noxious vegetation.

Presently, lightning presents the greatest threat of wildfire in the Lawson Creek area. Other activities such as recreation, timber harvest, and fuels treatment may contribute to some risk of human-caused fires.

Along with the lightning events, the area is subject to other weather events which favor fire during the summer months. Summer temperatures can range from the 70's to the 90's at the higher elevations, to well over 100 degrees at the lower elevations. Ridge winds are experienced at the higher elevations, and the lowest points in the drainage feel the effects of the winds from the main Lawson Creek drainage and the Illinois River Canyon.

The entire watershed is subject to the diurnal wind influence that is created by heating and cooling each day. During the late summer and into the fall, atmospheric conditions can bring hot and dry east winds to the area. These winds generally over-power the local winds, move at unusually high velocities, and maintain very high temperatures and low humidities for 24 hours a day.

Interpretation

The Southwest Oregon Ecological Assessment Team (SWEAT) prepared a study for the Regional Ecosystem Assessment Project on the range of natural conditions for fire in the Klamath Province. The authors indicate there is not conclusive evidence on what can be used as a reference or a natural range of conditions for fire. They state that prior to 1850 assumptions about the climate, fire regime, and Native American activities are a questionable reference point. They further conclude that the post-1850 conditions poorly represent natural conditions, due to the influence of early settlement. The report states there is evidence that suggests multiple, low-intensity underburns were more prevalent than individual stand re-setting fire events. "... our temporal window is small. Disturbance regimes of the last 300 years hardly give the range our ecosystems have experienced," (Atzet and Martin 1991). It is not known what the pre-historic "status-quo" was with regard to cycles of fire, because it is an element of such random and chaotic nature.

Fire cycles west of the Cascade mountains are estimated to be considerably longer than those found east of the Cascades, particularly in northeastern Oregon. Forest conditions in northeast Oregon can be referenced for the forest health issue and the effects of fire exclusion there. A similar scenario can be made for southwestern Oregon, only on a much longer timescale. Atzet and Martin suggest that fire suppression has increased the mean interval between fires, in the Douglas-fir series. Continued suppression may cause an "unnatural" build-up of fuels, resulting in a greater proportion of high-intensity fires when an area burns. Additional information on the average fire interval and estimated range of fire interval periods by plant series can be found in the Southwest Oregon LSR Assessment (Version 1.0, Table 12, Page 113).

Looking at the time frame in which fire has essentially been excluded from the Lawson watershed against the natural cycle of fire, it appears that overall, the watershed is not outside the range of variability. It is possible the portion of the watershed with a high occurrence of fire in the early part of the 20th century was on the high end of the range. Conversely, it is probable that those areas which have not been burned in the last 100 years, and those areas which typically support a more diverse community of fire dependent species, have begun to experience adverse effects from fire exclusion.

Fire starts will continue to occur and will continue to be suppressed within our capabilities, but the time is coming when a significant fire event of stand replacement intensity will occur. There is no precise way to predict the timing of such an event. If such a fire happens under moderate weather conditions, and in areas where fuel conditions are such that the fire burns with a lower intensity, the forest would benefit and the values associated with Late-Successional Reserve (LSR) will remain intact. However, under current policy, fires burning under these conditions are likely to be controlled in their early stages, thus precluding any such benefit. If another half century of fuels is allowed to build up on the forest floor, and/or a major wildfire event occurs under extreme weather conditions, a stand-resetting disturbance is likely to be the result.

Information Needs: Determine if fire exclusion has contributed to the degradation of certain plant species and unique habitats. Identify areas and habitats where the return of fire would provide a benefit, and what intensities would provide that benefit. Complete a fire management plan to determine conditions where prescribed fire will be used in LSR.

A more thorough fire history study collecting on-the-ground data could be conducted.

Management Opportunities: Prescribed fire can be used to achieve the resource objectives for encroached meadows, special and unique habitats, Late-Successional Reserve (LSR) and other land allocations.

Fire management plans need to be completed to determine conditions where prescribed fire can be used in the LSR and in the watershed. The fire management plan will incorporate the objectives and conditions for the LSR as described in the Southwestern Oregon LSR Assessment. The LSR assessment recognizes that fire can be used for the enhancement of fire-dependent species and prevention of stand replacement fire events. These objectives can be met using either natural-caused or management-ignited prescribed fire under the proper conditions. Generally, any fire in the LSR or in the watershed will need to be of low intensity, with an emphasis on the retention of snags and large woody material. Private land holdings will need to be considered and provided for in these management plans.

SOCIAL ASPECTS NARRATIVE

The following characterization and key questions were developed to describe the past, present and potential future human uses of the Lawson watershed.

Cultural Characterization

The Lawson watershed can be characterized as a dynamic landscape. For millions of years, the watershed evolved without the influence of humans. Over the last several thousand years, Native Americans followed by early settlers discovered and utilized its resources. Humans have continued to use the watershed for recreation and commodity production. Human use has been an integral part in the evolution of the watershed as it appears today.

The streams, the land, and the resources available have set limits and provided opportunities for prehistoric and historic inhabitants alike. Interactions between natural and human forces have shaped the human use of the area. Flat, open land, preferred by humans, is limited within the watershed.

Prehistorically, the stream and river corridors were used as resource procurement areas for shell and anadromous fishes. Upland areas were seasonally used as procurement areas and as travel routes. In historic times, the lure of mineral wealth or land to settle attracted people to this difficult terrain.

The history of human use within the Lawson watershed can be reconstructed and interpreted by examining the physical remains of previous inhabitants as well as observable changes which are the results of human activities. Remains, examined in conjunction with information provided by the natural environment and historical records, can reveal patterns of human behavior and adaptation. The Lawson watershed contains both prehistoric and historic sites which represent every cultural milestone in the local history from the Middle Archaic to the historic-contact period. Prehistoric sites, early settlements, mining, and early Forest Service sites can all be found within the watershed.

The prehistory and history of the watershed are treated in Stephen Beckham's *Cultural Resource Overview of the Siskiyou National Forest* (Beckham, 1978). Additionally, Bancroft and Wallings have compiled general histories of the region and fragmentary local histories exist in the form of oral histories, family journals, manuscripts and photo collections.

What were the prehistoric uses of the watershed?

The archeological record attests to a continuous human occupation of southwest Oregon for at least the last eight to nine thousand years. Study of the Marial site (35CU84, Griffin, 1983) on the Rogue River provides several carbon-14 dates beginning at 8560 B.P., clearly establishing the antiquity of human life in this portion of southwest Oregon. Excavations carried out near the mouth of the Illinois River at the Tlegetlinten site (35CU59, Tisdale, 1986) unearthed materials from a later ancient culture, possibly dating from two major periods of use at 6000 and 2000 years ago. Human adaptations in southwest Oregon appear to have changed from a moderately mobile, hunting-gathering lifestyle to more sedentary, specialized economies. These changes are likely to have been influenced by the effects of population displacement and growth as a result of changing climates and environments in southwestern Oregon as well as in other areas.

Ethnographically, the Tututni are representatives of the final cultural period in southwestern Oregon. These Native American groups either inhabiting or using the general vicinity consisted of several groups, each of which spoke a different dialect of the Athabaskan language and each having its own name. Collectively these Athabaskans are referred to as the Tututni or Coast Rogues.

These peoples inhabited much of southwestern Oregon from the beaches to the upland forests. They occupied the region from south of Bandon, Oregon to northern California and extending up the major drainages like the Smith, Chetco, Pistol, and the Rogue Rivers. The bands were numerous and the locations diverse.

According to an 1854 map and census compiled by J.L. Parrish, Indian Agent for the Port Orford District, the watershed was utilized by a Tututni band called the Shasta Costa (also called the Chasta Costa or Shas-te-koos-tees). The 1854 census by Parrish reported the "Shas-te-koos-tees" numbered 146 individuals with their major "chief" being Yah-chum-see. The map compiled by Parrish attempted to locate the approximate territories of the native peoples. According to this map, the Shasta Costas occupied the area surrounding the Rogue River from the Illinois to Big Bend and up the Illinois River. One of the major villages was at Oak Flat which is along the lower reaches of the Illinois River and across the river from the mouth of Lawson Creek. Wildhorse Ridge, on the western boundary of the watershed, was an informal boundary between the Shasta Costa and the Mikonotunne (also called Ma-can-o-tins), another Tututni band.

The general pattern of Tututni settlement indicates that large winter villages, containing 50 to 150 individuals, were established along coastal areas, rivers and major streams. Houses constructed at village settlements were substantial, consisting of semi-subterranean structures with bark or plank walls and roofs about twelve to sixteen feet square. These villages served as semi-permanent habitation spots, where foods collected throughout the year could be stored for use in the winter.

Generally, the Tututni were hunter-gatherers, subsisting on a diet consisting primarily of salmon and acorns and supplemented by a variety of game and collected food items. A seasonal round of activities was practiced which is characterized by small, dispersed hunting and gathering groups which would traverse the upland areas in search of game, plants, nuts, berries and other raw materials during spring and summer months. Temporary camps in the uplands consisted of grass covered, brush or animal hide shelters. Fall signalled the time for communal fishing and acorn gathering and the occupation of winter villages by multi-family groups. In winter, these people would subsist largely on stored resources collected during the summer and fall.

The Lawson watershed was likely used as a dispersal area, as described above, with the winter village at Oak Flat. The mainstem and forks of Lawson Creek were used for travel corridors and fishing. Wildhorse Ridge was used as a travelway between Oak Flat, Wildhorse Prairie, Fairview Meadow, Snow Camp, and the Pistol River drainage. The Game Lake area, which is immediately adjacent to the Lawson watershed, was probably used for a summer camp.

Differences in culture, lifestyle and economic subsistence between the native peoples and the newly arrived Euroamericans inevitably led to conflicts. By the end of the Rogue Indian Wars in 1856, the remaining population of aboriginal people had been removed to the Grand Rhonde and/or the Siletz reservations. Some individuals escaped relocation or were allowed to return to their homelands, mainly because of intermarriage with the white settlers. Additionally, some individuals returned to their homelands after the enactment of the Dawes Act which opened public domain allotments to Indian peoples. In 1938, twenty-three allotments were in existence in Curry County.

Glimpses of these people and their way of life have been made known to us through ethnographic information, the journals and manuscripts of the early white explorers and settlers, records and accounts from the Rogue Indian Wars and the archaeological record as it pertains to the Northwest Coast Culture area. The ethnographic information that exists for these people was acquired from research conducted at Siletz and Grande Rhonde reservations and the Smith River rancheria. However, by the time the interviews or ethnographic sketches were compiled in the late 1800's and the early part of this century, most sources of information were already a generation removed.

What were the historic uses of the watershed?

The historic period in this portion of southwestern Oregon begins as early as the 16th and 17th centuries with the voyages of the Spanish explorers. The earliest recorded contact between the coastal natives and Europeans is noted in the log of Captain George Vancover in 1792. Within the next quarter century trappers and traders, including North West Company fur trader Peter Corney and an American party of trappers led by Jedidiah Smith, came to southwestern Oregon.a Russian traders and whaling ships of various nations also had contact with the native people on this portion of the coast.

The discovery of gold along the southwest Oregon coast in the early 1850's precipitated the settlement of the lower Rogue River and its surrounding environs by Euroamericans. Gold was first discovered on the coast at places like Whiskey Creek and Gold Beach, named for the gold rich, black sand deposits found there. Later, gold deposits were found in the Rogue River. Early prospectors left little of the local country unexplored and some exploration of the Lawson watershed occurred at this time. In fact, Lawson Creek was named after a pioneer prospector (McArthur 1982).

Hostile relations with the local Indians arose as a result of conflicting land use by Euroamericans who trespassed on traditional native territories in the pursuit of gold. Ultimately, ill feelings between the native populations and the Euroamericans exploded into the Rogue Indian Wars of 1855-56. With the removal of the native inhabitants at the conclusion of the war, the area was opened to settlement.

Early settlers and miners trickled into the area during the 1860's. The settlers often built their homes on the same river or stream terraces that had provided homes for the native inhabitants. James and Eliza Fry left the Klamath River and moved to Oak Flat in 1868. In 1878, they were joined by Gertrude Thornton, her husband Samual, and their daughter (Atwood 1978). Later the Fry's built a homestead west of the mainstem of Lawson Creek (T.36S., R.12W., Section 3), the Thorton's homesteaded northeast of the Fry's on a pine flat, and an unknown settler located to the south of the mouth of Lawson Creek (Schroeder 1995). Other shelters were constructed by miners. Two known structures were located along the mainstem in T.37S., R.12W., Sections 16 and 20 (Campbell 1995).

The remoteness and difficult access precluded extensive development and most people followed a subsistence orientated way of life. This lifestyle made maximum use of the available fish and game, supplemented with produce grown and animals raised on small farms. Goods and services were traded, bartered and scavenged. Cash earning activities were limited and population densities low. Small scale mining and the sale of livestock and fish provided some income to local residents.

Mining within the watershed continued from the end of the nineteenth century through the 1940's. In the Word War II era, gold mining was replaced by mining for strategic minerals. Chromium and nickel were prospected with tractors mainly in the serpentinite areas of the watershed.

The Siskiyou National Forest was established on October 5, 1906. Henry Haefner, an early forester in the area states, "In 1909 the National Forest area was about as the indians had left it. Nothing of importance had been done to improve the property or even find out what it contained in the way of timber or other natural resources." The early foresters duties included mapping, estimating the amount of timber and agricultural land, law enforcement, fire protection, as well as a multitude of other jobs involved with the administration of a large timberland. The rangers often built their own stations and headquarters.

An important component of the historic fabric of the watershed is the trail system. Review of the Siskiyou National Forest 1911 map shows a trail going from Agness to Wildhorse Prairie and another trail going from Agness to near the Fry Place and up to Game Lake. It is likely these trails followed older aboriginal routes. For example the Wildhorse Road (Road 3318) follows an aboriginal travel route identified by "Chief" Elwin Frye (Martinek 1993). The Siskiyou National Forest 1915 map shows Ranger Stations located at Wildhorse Prairie and Game Lake. It could be possible they existed in 1911 since the trails access those locations. The 1915 map shows an additional trail that went from Wildhorse Prairie around the headwaters of the drainage and to Game Lake. The trail continues from Game Lake along the east side of the Lawson mainstem crossing the Illinois at Oak Flat. The 1924 map shows the first phone line in Lawson watershed going from Agness to Wildhorse Prairie and on to Snow Camp Mountain.

The Depression of the 1930's brought an influx of people to the public forest lands. Numerous out of work individuals sought survival in the mountains undertaking a subsistence economy lifestyle. These people were also engaged in prospecting and small scale mining encouraged by the revaluation of gold. The Depression Era also saw the development of the Civilian Conservation Corps (CCC), another important chapter in the history of the Pacific Northwest. Fire prevention and suppression, timber stand improvement, range improvement, soil conservation, road building and forest facilities construction were all undertaken by the CCC. The Civilian Conservation Corps provided employment and a measure of financial relief for men and their families.

In May of 1933, the first contingent of the Civilian Conservation Corps (CCC) was assigned to southwestern Oregon and stationed at Agness Camp, at the confluence of the Rogue and the Illinois Rivers. The 1937 map shows the first jeep road. It came up the Pistol River drainage to Pyramid Rock Lookout and on to Wildhorse Prairie Ranger Station and Wildhorse Lookout. The 1940 aerial photos show trees had been harvested to the east of Wildhorse Lookout to improve the view from the lookout. The 1940 photos also show a low water bridge crossing the Illinois River at Oak Flat. This could have been for logging or for access to the west side of the Illinois River.

Even though the historic element is by far more tangible than the prehistoric, little of this cultural fabric within the watershed is known. Many of the sites in the watershed have not been formally documented or evaluated for their historic significance.

Does the watershed contain any culturally significant traditional use areas?

There is no evidence to suggest the watershed is presently used for traditional activities by local Indian groups. Recognized tribes consulted (Tolowa, Karuk, Coquille and Siletz) did not provide any additional information regarding traditional use in the watershed.

Information Needs: The complete status and number of cultural sites in the watershed are unknown. Formal site evaluations of many sites have not been conducted.

Management Opportunities: Cultural resource surveys will precede all ground disturbing projects. All sites discovered will be documented and added to the Forest inventory. The significance of inventoried sites shall be evaluated for eligibility for the National Register of Historic Places. Suitable cultural resource properties may be interpreted for recreational use and educational benefit of the general public. There is an opportunity for partnership with the recognized tribes in the development of recreational and educational programs.

What are the major recreational uses and where do they occur in the watershed?

The earliest known recreational activities in the Lawson watershed were fishing and horseback riding. Willard Lucas and Cy Wood from Agness reported Lawson Creek was heavily fished in the 1930's (Schroeder and Rivera 1995). Agness Ranger Station records show 24,000 steelhead were released in Lawson Creek in 1939 to increase the stocking. Horseback riding and overnight camping was reported in the 1950's (Stansell 1995). In the 1960's, road-related recreational activities became more common. In the 1970's and 1980's, the road mileage in the watershed increased. Hiking and horseback riding decreased over this time period, as the amount of trail was displaced by roads and people used motor vehicles instead of horses for recreational transportation.

Today, the Lawson watershed continues to provide both roaded and unroaded recreation opportunities. The primary roads in the watershed are Roads 3318 and 3680. Road 3318 follows Wildhorse Ridge and connects to Road 3680 which travels around the headwaters of the watershed to Game Lake Campground and provides access to the Kalmiopsis Wilderness. Road 3680 also connects to Road 1376 which provides access to Snow Camp Lookout and the Chetco Ranger District. These roads are single-lane, gravel roads that serve recreation, commercial timber, and administrative traffic. There can be some heavy use of these roads during summer holidays and weekends as well as hunting season. The roads are closed at the upper elevations due to snow in the winter. There are no traffic counters on these roads, so the exact amount of use is not known. The remaining roads are spurs off of the these primary roads and were constructed to provide access for

timber sales. They also provide dispersed road-related recreation especially during hunting season. Currently there are about 60 miles of open system roads in the watershed.

In contrast to these roads, the area near the mainstem of Lawson Creek and to the north and east of Game Lake is largely unroaded and remains natural in appearance. (See Figure 23, Roadless Area Map). The dichotomy of roaded and unroaded acreage produces a watershed that is stratified into three recreational opportunity classes, based on the Forest Service Recreation Opportunity Spectrum (ROS) classification system. The ROS classification for the western and southern portions of the watershed is Modified. The central portion of the watershed along the mainstem and the northern portion of the watershed is classified as Semi-Primitive Non-Motorized (SPNM). The eastern edge of the watershed, north of Game Lake is classified as Semi-Primitive Motorized (SPM). This classification is due to Trail #1169 which goes from Game Lake to Oak Flat being open to motorcycles.

The majority of the recreation use in the watershed is tied primarily to the existing road system. Leisure driving, dispersed camping, hunting, hiking, nature study, botanical study/viewing, snow play, and gathering of special forest products all take place. The amount of use for each of these activities is not known.

There are no developed recreation facilities in the watershed, although Game Lake Campground and Snow Camp Lookout are nearby and access is provided to these locations through the watershed. A developed campground near Wildhorse Prairie was closed in 1994 due to the high number of danger trees and the minimal amount of use the campground received. Dispersed camping takes place at Huntley Spring and Wildhorse Meadow and other locations primarily on summer weekends and holidays as well as during hunting season.

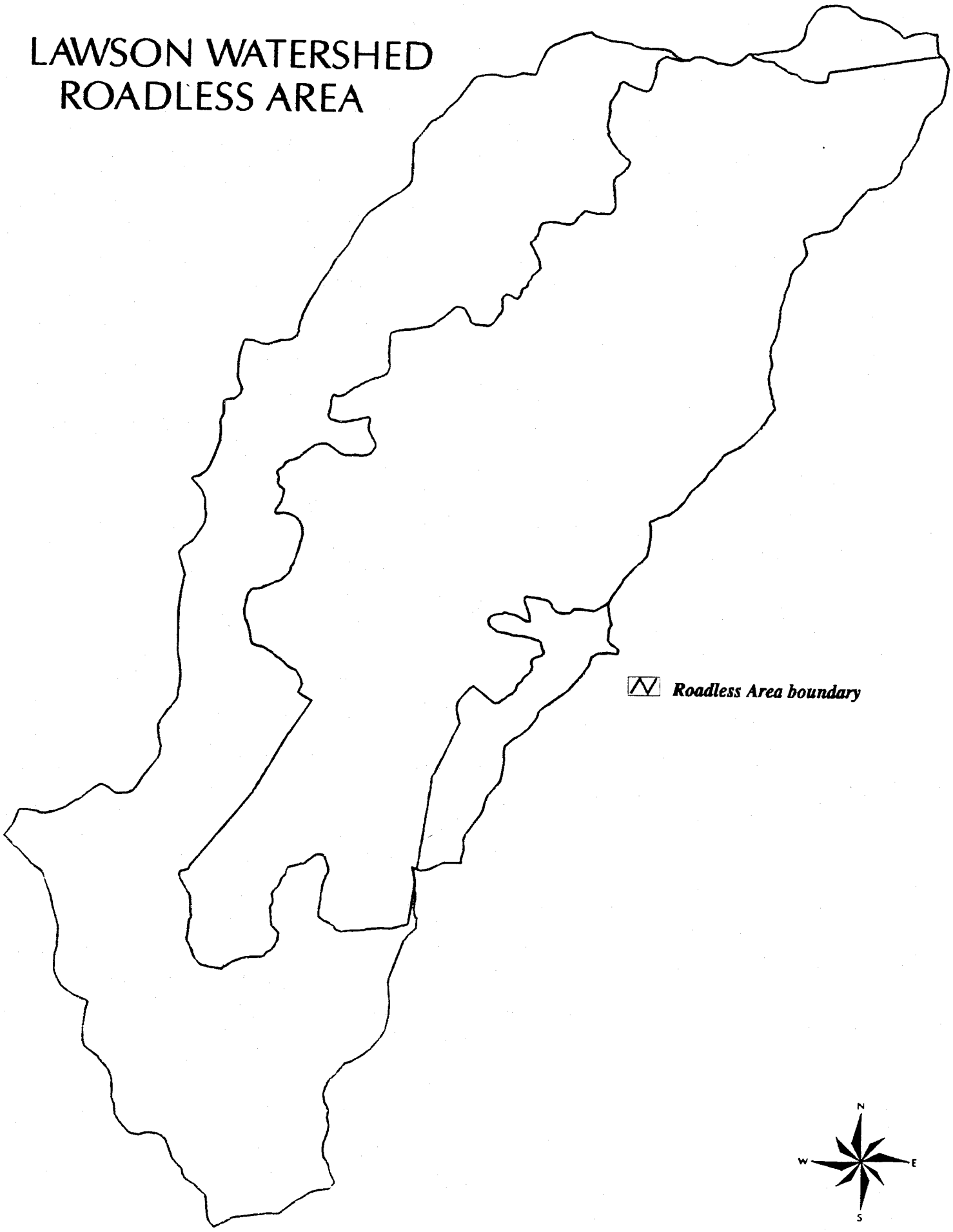
Trails are limited in the watershed. Portions of the Game Lake Trail (#1169) which goes from Game Lake to Oak Flat on the Illinois River is in the watershed. The Lawson Creek Trail (#1173) goes from Game Lake down to the Lawson mainstem and then up to the Pine Grove Trail. These trails are moderate to difficult with use limited to the summer due to snow at higher elevations and the necessity of fording the Illinois River (Trail #1169) or the mainstem of Lawson Creek (Trail #1173). The Lawson Creek Trail travels through the center of the unroaded section of the watershed providing opportunities for solitude and semi-primitive recreation experiences. Construction of a trail bridge across the mainstem was identified in the Siskiyou LRMP Appendix B as a Recreation Capital Investment Project. The liklihood of this project being completed in the near future is very low to non-existent.

The Lawson watershed does provide good opportunities for those interested in botanical study and viewing. Portions of the Snow Camp and Sourgame Botanical areas (Management area 4, Siskiyou LRMP) are in the watershed. The Huntley Spring area is an exciting location for botanists. With 28 different plant associations, the watershed is very diverse in vegetation. Nine sensitive plant species are known to exist. In addition, there are tree and plant species such as Brewer spruce, wild azalea, darlingtonia, four species of violets and Vollmer's lily which provide interest to the public.

Wildhorse Prairie provides a limited opportunity for snow play and sledding. Generally, there is only a short time frame when there is adequate snow and there is still access to the prairie. In the past, people have driven their four-wheel-drive vehicles on the prairie damaging the grasses and soil. There is a rutted road which goes to the upper level of the prairie which receives occasional use and is in need of restoration. This road was first visible in the 1957 aerial photos. An airstrip on the eastern side of the prairie is also visible in these aerial photos, but has since recovered.

Figure 23

LAWSON WATERSHED ROADLESS AREA



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Recreation trends

Recreation trends shown in the 1993 Oregon State Comprehensive Outdoor Recreation Plan (SCORP) Survey indicate that demand for dispersed recreation use of various types is increasing. The predominant activities that households are participating in, listed in rank order, are sightseeing/pleasure driving (69.3 percent), swimming (58.7 percent), boat fishing (40.6 percent), tent camping (39.1 percent), and nature study and wildlife viewing (38.5 percent). Demand for recreation opportunities in this watershed are expected to remain the same or gradually increase from current levels. SCORP also indicates a demand for trails is increasing, although more emphasis is for accessible trails for the disabled, trails in or near or connecting to urban areas, trails that are closer to home for all users, and trails for equestrian users. Also, emphasis is for trail maintenance or reconstruction over new construction (1995 Oregon Recreational Trails Plan). Locally, there has been an increased interest in accessible trails; equestrian, mountain bike, and all-terrain-vehicle (ATV) trails; and day-use trails.

Another trend is declining road maintenance funds to keep roads open for public access. In addition, road closures for fish and wildlife protection, Port-Orford-cedar protection, road-related watershed restoration, meadow protection, and other resource-related purposes will lower current levels of roaded access in the watershed. Both of these trends indicate there will be fewer roads in the watershed in the future than there are now. Consequently, road-related dispersed recreation opportunities will decline, even though demand is expected to remain the same or gradually increase.

The implications are that while demand for dispersed road-related recreation opportunities increase, actual opportunities decrease. This may result in some segments of the public being unhappy with any proposals that close roads. In some cases this could lead to vandalism of signs and property, violations of gate closures and a general dislike of federal authority.

Information Needs: Current data on recreation use, recreation demand, types, seasons, numbers of people, areas of interest and opportunities for partnership is needed.

Management Opportunities: Recreation facilities at Wildhorse Prairie can be improved and access can be controlled. There is an opportunity to improve a dispersed camping area on the north edge of the prairie east of Road 3318. Three camping sites could be accessed by constructing a 200 foot graveled road, and a pit toilet could be provided. Access could be controlled by placement of small boulders between the camping area and the prairie. Access to the meadow along Road 3318 could be controlled by ditching and placement of small boulders and/or logs and signage. The four-wheel-drive road to the upper prairie could have waterbars re-dug and seeded with native grasses. There is an opportunity to provide information on the importance of native grasses.

The two existing trails in the watershed need to have continued maintenance so recreational use can continue. There is an opportunity to create a trail or identify the hiking opportunity to travel between meadows and peaks in the southern portion of the watershed. Snow Camp Meadow, Collier Butte, Huntley Spring, Meg's Meadow and Fairview Meadow could be connected. Botanical, wildlife and geologic information and interpretation could be provided.

Currently there is no place on the district that is designated for ATV's or mountain bikes. With road closures, there is an opportunity to have this type of use. In the Lawson watershed, there is a potential to connect the 3318240 road with the 3318310 road to create a loop trail. However, the risk of infecting Port-Orford-cedar with *Phytophthora lateralis* needs to be investigated before this opportunity is pursued.

Information should continue to be provided to the public on the appropriate use of the undeveloped and dispersed areas, proper disposal of garbage and waste (pack-it-out), and to prevent fishing in restricted areas.

What commodities can be produced from the watershed?

Timber

The 1940 aerial photos show the first timber harvest in the watershed was occurring. An area east of Wildhorse Lookout was being harvested to improve the view from the lookout. The 1940 photos also show a low water bridge crossing the Illinois River at Oak Flat. This could have been for logging or for access to the west side of the Illinois River from Oak Flat. In the 1957 photos, only the pilings remain, suggesting floods had caused the bridge to wash out.

The 1957 aerial photos show three large units had been tractor logged in the headwaters of the North Fork of Lawson Creek. These units were probably part of the Hunter Creek Timber Sale which sold in 1955. This timber sale provided access in the Hunter Creek area and continued to Wildhorse Ridge. Three timber sales located in the Lawson watershed were sold in 1958. From that year until 1990, timber harvest was common in the Lawson watershed. (See Figure 24, Managed Stands Map, Table 14 shows the acres that were harvested in five-year periods).

Table 14. Acres Harvested in five-year periods.

Year of Harvest	Acres	Percent
55-59	422	2
60-64	448	2
65-69	627	3
70-74	881	3
75-79	463	2
80-84	331	1
85-89	593	2
90-94	68	<1
Total	3833	15

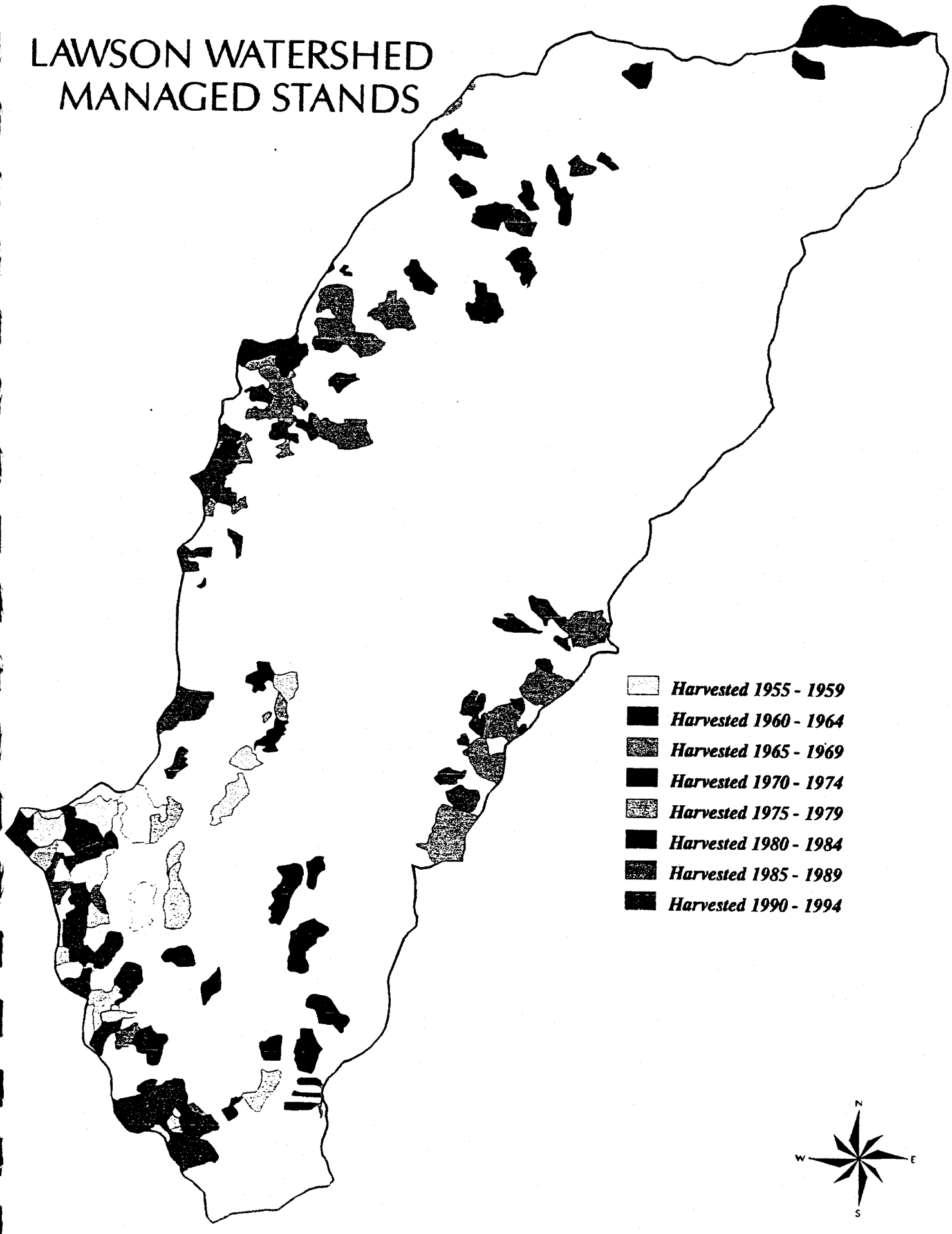
The 1964 aerial photos show that timber was being harvested with cable systems as well as tractor. Previously the timber was harvested by tractor only. The road system was greatly expanded in the 1960's and 1970's for timber sales. Roads to Saddle Mountain, Game Lake, and along Wildhorse Ridge were improved during this time period. It is suspected that the Lawson watershed became infected with *Phytophthora lateralis* in the 1960's. The South Lawson Cedar timber sale, sold in 1975, harvested large cedar that had died or were near infected cedar trees. For the most part, mature and old-growth Douglas-fir was harvested from the Lawson watershed, but thinning of second-growth Douglas-fir stands also took place along Wildhorse Ridge. These trees resulted from stand replacement fires approximately 80 to 120 years ago.

Timber harvest continued in the 1980's at similar levels as before, however in 1991 the U.S. Forest Service was enjoined from selling timber in northern spotted owl habitat. The only timber sale which was sold in the Lawson watershed since that time was one harvesting small trees to the north and east of Wildhorse Lookout to improve the view from the lookout and remove encroaching trees from the meadow.

The local economy of the southern Oregon coast was highly dependent on the natural resources industry. The timber and wood products industry employed the greatest percentage of people in the region, either directly or indirectly, for several decades. In the 1950's and 1960's there were numerous wood products mills in the Gold Beach area. One by one they closed, until there was just one large mill and one small mill remaining in the Gold Beach area. In the late 1980's, the large mill closed, leaving only Tamms Mill in Ophir open today. The only large mill still operating in the area is South Coast Lumber in Brookings.

Figure 24

LAWSON WATERSHED MANAGED STANDS



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The Siskiyou LMRP (1989) was amended by the Record of Decision and Standards and Guidelines for Management of Habitat for Late-Successional and Old-Growth Forest Species Within the Range of the Northern Spotted Owl (ROD) (April 1994). With the ROD, the Lawson watershed has been designated a Key Watershed. A large portion of the watershed has been designated as Late-Successional Reserve (LSR) and is part of Fishhook/Galice LSR. The west portion of the watershed (Wildhorse Ridge) and the southwestern portion of the watershed has been designated as matrix. (See Figure 2, Land Management Allocations for additional land allocations within the watershed. Due to travel along the 3318 and 3680 roads, leave tree groupings within the foreground area (300 feet) of the road could be considered to protect visual resources during timber harvest activities.

Management Opportunities: The objective of the LSR is to protect and enhance conditions of late-successional and old-growth forest ecosystems. Limited stand management is permitted if treatment improves or hastens the stand to mature conditions. Initial GIS analysis suggests there are 148 acres which could be commercially thinned in LSR. Site-specific information would have to be obtained before specific recommendations could be made for harvest in these stands (See Figure 25, Possible Harvest Opportunties).

Most commercial timber harvest in the Lawson watershed will occur in matrix lands or in retention and partial retention allocations if visual objectives are met. Commercial thinning would likely occur in stands that are approximately 40 to 80 years old. Initial GIS analysis shows there are 554 acres that meet this criteria. Regeneration harvest could occur in stands that are greater than 80 years old. Initial GIS analysis shows there are 2799 acres of this age class in matrix lands. Exact prescriptions would have to based on site-specific information, the above information are only initial estimates. (See Figure 25, Possible Harvest Opportunities).

Commercial timber harvest may result from salvage and sanitation proposals for Port-Orford-cedar. This would occur in or near riparian reserves where present and future coarse woody debris needs are met and other Aquatic Conservation Strategy objectives are not adversely affected. Many heavily diseased streams have exceeded their natural range of variability in large wood supply, although salvage has reduced this supply in the upper North and South Forks of Lawson. Site-specific information would have to be obtained before specific recommendations could be made for harvest in these stands.

Some commercial timber harvest may occur as a result of removing trees that have encroached on meadow habitat.

Special Forest Products

Special forest products are a variety of products used for personal and commercial purposes. Products include: azalea transplants; cedar posts, poles, and bolts; variety of mushrooms; ferns; Christmas trees; burls; brush; boughs; beargrass; alder; and firewood. The Lawson watershed is one of the better areas on the district for collection of Port-Orford-cedar boughs, beargrass, and salal (Gay 1995).

It is probable boughs and firewood were commercially gathered in the 1950's as some of the road system was established (Stansell 1995). In the 1960's and 70's as the road system expanded and demand from the population increased, both personal and commercial bough collection, firewood cutting, and gathering of other products increased. After timber harvest levels fell off in the 1990's and as a world-wide demand for a variety of special forest products increased, there were more people employed by this activity than ever before (Gay 1995).

Adverse resource effects in the last ten years were limited to over-cutting of Port-Orford-cedar boughs and possibly, the spread of *Phytophthora lateralis*. Currently, there are also concerns with over harvest of beargrass and mushrooms as well as other products. Monitoring efforts have increased in recent years to avoid resource damage.

Currently less land is available for special forest products collection due to road closures to protect Port-Orford-cedar and protection of botanical areas in the Lawson watershed. There is also a temporary loss of Port-Orford-cedar boughs due to past over harvest. Little firewood is available in the Lawson watershed due to decreased timber harvest.

In the future, the demand for personal and commercial special forest products will likely increase as the accessibility to a world-wide market increases and the revenue received from the products increases. At the same time, availability may decrease due to concerns of over-harvest of special forest products and the closing of roads which would access the products. There may be a similar increase in prices for other special forest products as has been experienced by firewood today.

Management Opportunities: Only a few specific concentrated areas for harvest have been identified. Bough collection has recently been coordinated with roadside cedar removal. More opportunities for bough harvest will occur as Port-Orford-cedar becomes more established in the older plantations. Some special forest products can be collected in Late-Successional Reserve if LSR objectives are protected. Standing trees which could be cut for firewood are limited to matrix lands.

Mining

Some of the first permanent Euroamerican settlers to the Rogue and Illinois River region were miners. These prospectors were attracted to the region during the gold rush era of the 1850's. Lawson Creek was named after a pioneer prospector (McArthur 1982). Small scale placer mining has taken place in Lawson Creek since that time and continued to the 1950's (Campbell 1995).

In the World War II era, strategic metals such as chromium, copper, and nickel were needed for the war effort. The serpentinite areas of the Lawson watershed were prospected for these minerals with tractors. The 1957 photos show mining tractor roads in the southern portion of the Lawson watershed and around Collier Butte. There were also mining roads west of Game Lake going down to the Lawson Butte area. (1940 aerial photos do not show this activity.)

In the early 1990's, Mindoro, a Canadian corporation, surveyed and claimed most of the west half of the watershed. They also conducted two test drillings in the southern Wildhorse Ridge area. Today, those claims are no longer valid. At this time there are no known mining operations active within the watershed and no plans of operation have been submitted.

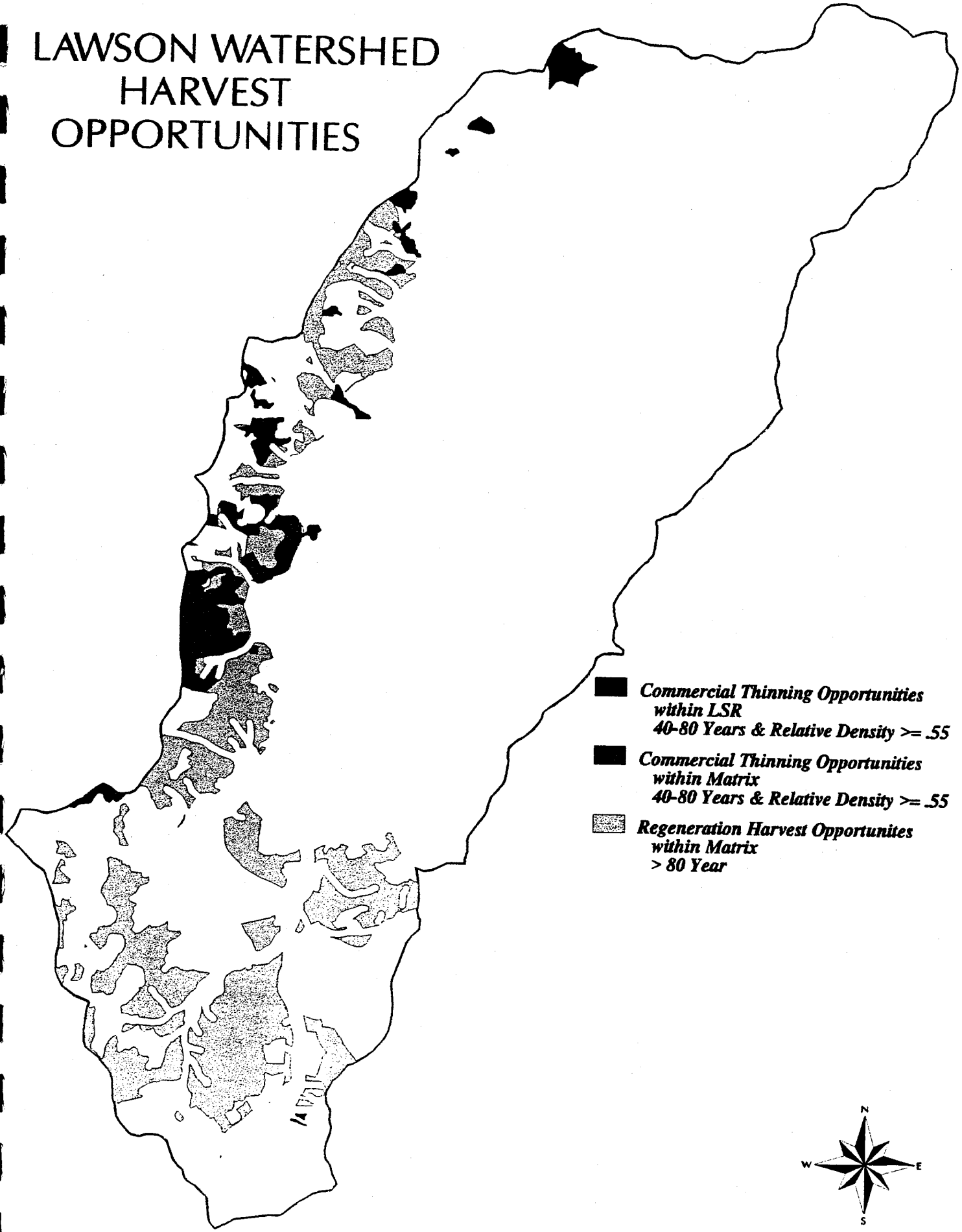
Management Opportunities: The Lawson watershed is known to contain low concentrations of gold, chromium, nickel, copper, and other minerals. With low concentrations of minerals over large tracts of ground, the price for the mineral must be high to make mining operations economically feasible. At this time, it does appear that there is a market for this type of activity. However, if political or economic conditions change, mining in certain areas could take place, especially in the serpentinite areas.

Grazing

Grazing probably began in the watershed with Morris Fritsche, who had a homestead in the Quosatana watershed. Fritsche ran a small herd of cattle (1890's to 1944) on Wildhorse Prairie prior to and after the Siskiyou National Forest was established. For many years he "held domain" over the surrounding country, claiming it as his own. After the Forest Service took over he greatly resented the enforcement of a fee for the grazing of his cattle and threatened to kill Dick Helm, an early Agness Ranger who tried to collect the grazing fee (Haefner, 1975). The 1937 Siskiyou National Forest Range Management Plan stated Fritsche had applied for a permit to graze two head of cattle on the prairie (Martinek 1993). Currently, there are no allotments in the watershed and none are planned at this time.

Figure 25

LAWSON WATERSHED HARVEST OPPORTUNITIES



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Which roads are needed for future access in the watershed and which roads need treatment to protect the resources of the watershed?

In response to a shrinking road maintenance budget, the Forest completed a Network Analysis in Spring 1994 to determine which roads were needed to continue land management activities and to provide general public access. These roads were classified as either primary or secondary roads. Primary roads are the main roads in the watershed. For the Lawson watershed, they are Roads 3318, 3680 and 1376 and total 13 miles. In addition, there are 29 miles of secondary roads. There are 18 miles of road that were classified as candidate roads that could be closed to vehicular traffic as need, funding and priorities allow. Currently, there are 6 miles of road that are closed to vehicular traffic, 8 miles of road that has been decommissioned, and an additional 2 miles that is under contract for decommissioning (See Figure 26, Road Classification Map).

Decommissioning is a type of road treatment that makes the road unusable by vehicles, but can provide greater protection to the streams and resources in a flood event. Examples of decommissioning include pulling culverts, pull back of road fills, ripping of the road surface. Any one or all of these treatments could be used to decommission a road.

Some of the roads there are open to vehicles have been "stormproofed." This is a road treatment where outsloping, ditches, and/or waterbars are placed to control water and lessen the amount of sediment that would flow into a stream during a major storm event. The following roads have had this treatment: 3318.310, 3318.312, 3318.240, 3318.245, 3318.246, 3318.248, 3318.280, 3318.281.

The Network Analysis was used as a starting point to further assess the roads in the watershed from a variety of resource perspectives. These include: sediment source potential, effect on peak flow, proximity to critical reach, wildlife concern, proximity to Port-Orford-cedar (POC), level of recreation use, and level of potential or actual administrative and commercial use. Each road was rated with a high, moderate or low factor on how that road might affect the resource. Finally, a future treatment option and any comments were recorded.

Table 15 describes the road assessment for the watershed.

Information Needs: Fifteen roads and associated spurs need evaluation to determine a specific treatment and status. Roads 3318.310 and 3318.312 need evaluation to determine the effectiveness of past treatments.

Management Opportunities: Treatments for specific roads are listed in Table 15. Road 3318 is in need of repair and maintenance. Roads 3680.350, 3680.351, 3680.352 and spurs, 3680.402 (portion not decommissioned), and 3680.496 have been identified as in need of drainage or erosion treatments. Methods and exact locations of treatment need to be determined.

Figure 26

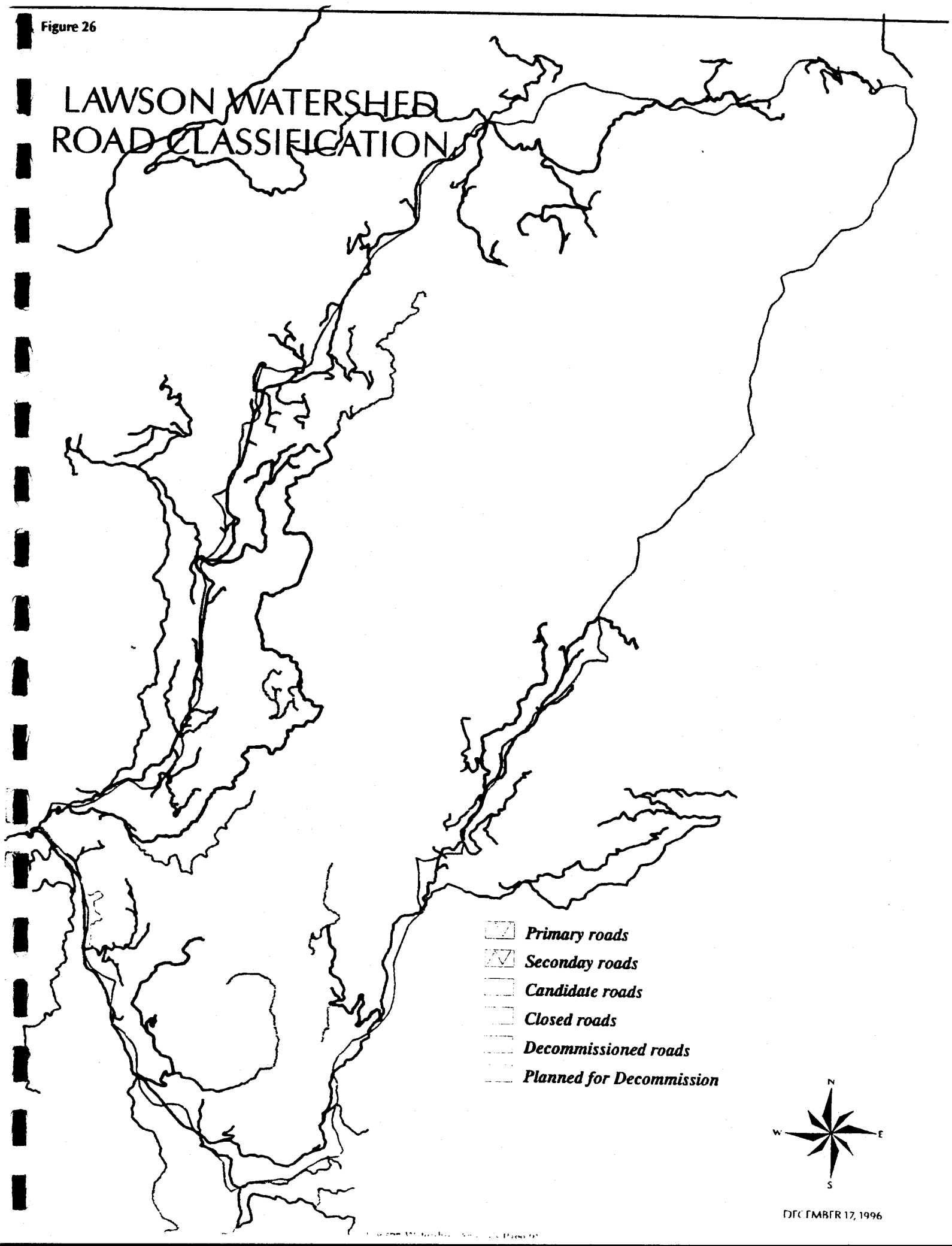
LAWSON WATERSHED
ROAD CLASSIFICATION
Primary roads
Seconday roads
Candidate roads
Closed roads
Decommissioned roads
Planned for Decommission
N
W
E
S
DECEMBER 17, 1996

Table 15. Road Assessment

Road	Transport Class	Sediment Source	Peak Flows	Proximity to Critical Reach	Wildlife	POC	Recreational Use	Administrative Commercial	Treatment and Comments
1376	Primary	Low	Low	Low	Low	High	Mod/High	Mod	Tie road. Access to Snow Camp Lookout. Seasonal closure for POC.
3318	Primary	Low	Low	Low	High/Low	Mod	Mod/High	Mod	High wildlife use/concern at Wildhorse Prairie, remainder of road is low. Keep vehicles off of Prairie. One gorse population south of 3318.220 spur. Road is in need of repair (slumps) near Road 33.
3318.120	Secondary	Low	Low/Mod	Low	Low	Low	Low	Low	Access to private land (Sec 30 and Fry Place) and Trail #1173.
3318.122	Secondary	Low	Low/Mod	Low	Low	Low	Low	Low	Access to Fry Place. Waterhole is infested with Phytophthora.
3318.123	Closed w/ tank trap	Low	Low	Low	Low	Low	Low	Low	Maintain closure. Remove culverts if any exist.
3318.129	Secondary	Low	Low/Mod	Low	Low	Low	Low	Low	Access to Fry Place.
3318.12F,G	Closed	Low	Low	Low	Low	Low	Low	Low	No treatment necessary.
3318.12H	Dirt road	Low	Low	Low	Low	Low	Low	Low	Access to Fry Place.
3318.130	Secondary	Low	Low/Mod	Low	Low	Mod	Low	Mod	Stormproof and putting creek in channel FY96 contract. Evaluate seeps, may need additional waterbars. Two large scotch broom populations. Uninfested waterhole. Good fire observation point.
3318.180,181	Closed w/ tank trap	Evaluate	Evaluate	Low	Low	Mod	None	None	Evaluate to determine future treatment. Road is in matrix. The debris flows that took out the 3318310 road started from this road.
3318.190,191	Secondary	Low	Low	Low	Low	Mod	Low	Low	Only first 1/4 mile in Lawson. Waterhole is infested. Access to matrix.
3318.195,196	Closed w/ tank trap	Evaluate	Evaluate	Low	Low	Mod	Low	Low	Access to matrix. Need to evaluate for treatment.

Road	Transport Class	Sediment Source	Peak Flows	Proximity to Critical Reach	Wildlife	POC	Recreational Use	Administrative Commercial	Treatment and Comments
3318.200	Secondary	Low	Low	Low	High	Low	Low	Mod/High	Gate closure for protection of Wildhorse lookout and wildlife.
3318.202	Closed w/ guardrail	Low	Low/Mod	Low	Low	High	Low	Low	Closed for POC protection. Access to matrix.
3318.210	Candidate	Low	Low	Low	Mod	Mod	Low/Mod	Low	Previously provided access to campground. Campground no longer open, although dispersed camping does take place. Berm at fire waterhole could be removed. Sensitive plant location nearby.
3318.240,245, 246,248	Secondary	Low after treatment	Evaluate	Low	Low	High	Low/Mod	Low	Stormproofing w/FY96 contract. Tank trap currently at MP2.15. POC Super Gate proposed. Access to matrix.
3318.253	Candidate	Low	Low	Low	Low	Low	Low	Low	Access to matrix. No treatment necessary.
3318.260,261, 264,265	Closed w/ berm	Low	Low	Low	Low	Low	Low	Low	Access to matrix. No treatment necessary.
3318.280,281	Candidate	Mod	Low/Mod	Low	Low	Mod	Low	Low	Stormproofing 1.15 miles in FY96 contract. Access to matrix.
3318.282	Candidate	Low	Low	Low	Low	Mod	Low	Low	Access to matrix. Candidate for stormproofing.
3318.310 (MP 0.0 to 312 spur)	Secondary	Mod	Low	Low	Low	High	Mod	Low	Access to matrix. Need to evaluate spur roads off of 310 for possible treatment.
3318.310 (312 spur to 314 spur)	Secondary	Mod	Low/Mod	Mod	Mod	High	Mod	Low	Access to matrix. Evaluate 310 for effectiveness of broad-based dips, drive-ability and haul.
3318.310 (314 spur to decommission portion MP 8.0)	Secondary	Low/Mod	Low/Mod	Mod	Low	High	Mod	Low	Access to matrix. Evaluate 310 for effectiveness of broad-based dips, drive-ability and haul.

Road	Transport Class	Sediment Source	Peak Flows	Proximity to Critical Reach	Wildlife	POC	Recreational Use	Administrative Commercial	Treatment and Comments
3318.312	Secondary	Low/Mod	Low/Mod	Low	Mod	Mod	Low/Mod	Low/Mod	Non-drivable stormproofing beyond bridge. Need to evaluate effectiveness of stormproofing. Need to evaluate pulling pipes beyond the bridge. Moderate recreation and administrative use to .1 mile past bridge, low use beyond.
3318.314	Decommis-sioned								High POC risk.
3318.325	Candidate	Evaluate	Evaluate	Low	Low	Low	Low	Low	Need to evaluate for condition and treatment.
3680 (3318 to 1376)	Primary	Low	Low	Low	High/Low	High	Mod/High	Mod	Access to Snow Camp Lookout. High wildlife use/concern near Fairview Meadow, Low elsewhere.
3680 (1376 to Lawson Trail-heads)	Primary	Low/Mod	Low	Low	Low	High	Mod	Mod	Evaluate for drainage problems. Large Scotch Broom population north of 3680401 road.
3680 (Lawson Trailheads to end)	Primary	Low	Low	Low	Low	High	Mod	Low	Evaluate for drainage problems. Most of the road is in the Horse Sign watershed, some is in Lawson.
3680 L,N,F spurs	Closed w/ berm	Low	Low	Low	Low	Mod	Low	Low	Accessed "football field" units. No treatment necessary except for Scotch broom population which is present.
3680.320, 322,323	Candidate	Low	Low	Low	Low	Low	Low	Low	Evaluate for stormproofing. Access to matrix.
3680.325	Candidate	Low	Low	Low	Low	Low	Low	Low	Under contract for decommissioning.
3680.330	Candidate	Low	Low	Low	Low	Low	Low	Low	Candidate for decommissioning but does access matrix.
3680.330 E,F,G,H spurs	Candidate	Evaluate	Evaluate	Low	Low	Low	Low	Low	Need to evaluate for treatment. Access to matrix.
3680.332	Candidate	Low	Low	Low	Low	Low	Low	Low	No treatment necessary. Access to matrix.

Road	Transport Class	Sediment Source	Peak Flows	Proximity to Critical Reach	Wildlife	POC	Recreational Use	Administrative Commercial	Treatment and Comments
3680.341	Candidate	Low	Low	Low	Low	Low	Low	Mod	No treatment necessary. Helicopter landing for Upper Pistol TS. Access to matrix.
3680.350	Secondary	Mod	Mod	Low	Mod	High	Low	Low	Last .5 mile has water diversion, gullying. Needs treatment - evaluate for stormproofing or decommissioning. Access to matrix. Small waterhole is uninfected and can be used for helicopter dip spot. Possibly close road after waterhole.
3680.351	Candidate	Low/Mod	Low	Low	Mod	Low	Low	Low	End of road has been decommissioned. Still some road problems before the decommissioned section. Water diversion, road erosion. Could close to small waterhole. Need to evaluate for stormproofing or decommissioning.
3680.352, A,B,C spurs, 356,357,358	Secondary	Evaluate	Low	Low	Mod	High	Low	Low	Drainage problems. Need to evaluate. Access to matrix. Infested waterhole. Sanitation possibility?
3680.351 D,E,F,G spurs	Closed w/berms	Low/Mod	Low	Low	Low	Mod	Low	None	Mining roads. Surface erosion and diversions but equipment would cause more damage than if fixed the problem.
3680.380	Candidate	Low	Low	Low	Low	Mod	Low	Low	No treatment necessary. Access to matrix.
3680.390	Secondary	Low	Low	Low	Low	Mod	Low/Mod	Low/Mod	No treatment necessary. Uninfested waterhole. Accesses dispersed camping area.
3680.401	Closed w/ tank trap	Low	Low	Low	Low	High	Low	Low	Some surface erosion occurring. Could pull culverts. Need to evaluate for decommissioning. Road is primarily in Collier watershed. Road closed for POC protection.
3680.402,496	Secondary	Low/Mod	Low/Mod	Low	Low	Mod	Low	Low	End of road decommissioned. Treatment necessary to improve drainage and minimize erosion. Need to evaluate for stormproofing or decommissioning. Need to maintain helicopter landing on 402 and 496 and RAWS station. Could change trail access to RAWS station to allow for more road obliteration. There is a gorse site 1/4 mile past first helicopter landing. Access to matrix.

Road	Transport Class	Sediment Source	Peak Flows	Proximity to Critical Reach	Wildlife	POC	Recreational Use	Administrative Commercial	Treatment and Comments
3680.497	Decommis-sioned								
3680.403	Decommis-sioned								
3680.407,493	Secondary	Low/Mod	Low	Low	Low	Mod	Low	Low	Uninfested waterhole at MP0.3. Need to evaluate for decommissioning beyond that point.
3680.408,492	Candidate	Low/Mod	Low	Low	Low	High	Low	Low	Need to evaluate for treatment.
3680.409	Closed w/ berm	Low	Low	Low	Low	Low	Low	Low	Need to evaluate for treatment.
3680.410	Closed w/ berm	Low	Low	Low	Low	Low	Low	Low	Not drivable. Need to evaluate for any future treatment.
3680.411	Candidate	Low	Low	Low	Low	Low	Low	Low	Waterbarred, and drivable. Need to evaluate for any future treatment.
3680.491	Closed w/ berm	Low	Low	Low	Low	High	Low/Mod	Low	Closed past dispersed camping area. Need to evaluate for any future treatment.
3680.495	Candidate	Low	Low	Low	Low	Mod	Low	Low	No treatment necessary.

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1911-72 Siskiyou National Forest maps.

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