

Spencer Creek Pilot Watershed Analysis

Executive Summary



A day of huckleberry picking at Buck Lake around 1905 (photo courtesy of the Anderson family photo collection).

August 1995

Executive Summary

Introduction

The following is a short executive summary of the Spencer Creek Pilot Watershed Analysis. It is intended to highlight and integrate the significant findings and recommendations of the analysis. For a detailed explanation of the findings, a thorough review of the watershed analysis is necessary.

The major concerns for resource values in the watershed are.

- Late successional forest habitat for wildlife;
- forest health; and
- stream, riparian, and wetland habitat and its impact on associated aquatic dependent species.

Although these values are still present and stable, they have been reduced over time in quantity and quality. Late successional habitat is most likely limited primarily to the upper portion of the watershed on federal lands. The lack of connectivity between blocks of late successional habitat may limit the movement of some wildlife species within the watershed and between watersheds. Fire suppression and logging have altered stand densities, fuel loads, stand structure, distribution of seral stages, and species composition. The incidence of disease and insects in some areas and the potential for high intensity fires in the watershed have increased. Sedimentation and elevated stream temperatures have changed habitat conditions to favor species more tolerant of fine sediments and warm water. This, coupled with exotic species introductions has altered fish, aquatic plant, and macroinvertebrate communities. The migratory Klamath River fish population spawning in Spencer Creek appears to be fairly stable and may be less impacted by changes and current conditions in Spencer Creek watershed. Prior to the construction of dams on the Klamath River, Spencer Creek supported anadromous fish spawning runs.

Snow melt processes drive the hydrologic cycle, with precipitation ranging from 20 inches at the lower elevations to over 60 inches in the wilderness. Buck Lake, a 1,500 acre wetland near the headwaters, historically provided a catchment for storage of spring snow melt, but no longer functions in this capacity. Air temperatures and moisture regimes vary from the lower to higher elevation zones and support several vegetation communities. Vegetation ranges from ponderosa pine communities in lower elevations to white bark pine communities in the Mountain Lakes Wilderness. Historically (around 1900), 60 to 70 percent of the vegetation was in the mid to late seral stage. Currently, 30 to 40 percent of the forest is in mid to late seral condition. This includes both upslope and riparian zone vegetative communities. Lightning fires, insects, and disease historically maintained stand structure, seral stage distribution, densities, fuel loads and species composition. See Table A later in this summary for further information.

Highlights of the Analysis

Human use of the Spencer Creek watershed has a long and varied history. Prior to European settlement, Native Americans used the area for seasonal hunting and gathering activities. Problems concerning the watershed's cultural resources mostly relate to protection of historic, 19th Century sites and features near the mouth of Spencer Creek. Recreation use in the watershed has been and continues to be light. Primary areas of concern regarding recreation activities are the unauthorized firewood cutting in the upper reaches of Clover and Spencer Creeks, off-road motorized vehicle use, and uncontrolled recreational activities primarily at the mouth of Spencer Creek. Of the 40 human caused fires on record for USDA Forest Service and Oregon Department of Forestry protected lands in the watershed, nine of the fires occurred near the mouth of Spencer Creek.

Different resources in Spencer Creek have contributed to the economic base for local and surrounding communities. Native Americans no longer use the area for

seasonal hunting and gathering. The watershed area provides recreational opportunities that include: sightseeing, fishing/hunting, camping, hiking, mushroom and firewood collection, skiing, and snowmobiling. Livestock grazing has been a viable use in the watershed since the 1860s. Buck Lake was drained in the 1940s to increase grazing forage in the watershed. Commercial timber harvesting began in 1930 and has provided a continual supply of timber for the last 65 years. Approximately 90 percent of the watershed has been entered for harvest, and roads have been built to access these areas.

Logging and associated road development, and fire suppression are identified as the management activities most affecting the terrestrial forest environment. Currently, approximately 25 percent of the federal land and 15 percent of all the lands in the watershed is late successional forest. The majority of the late-successional forest occurs in the Mountain Lakes Wilderness and the Late Successional Reserves in the upper portion of the watershed. In the remainder of the watershed, late-successional forest occurs as small isolated blocks. Due to the distribution of blocks of late-successional forest, habitat connections are minimal between large late-successional forest patches occurring within the watershed. This may restrict the movement and dispersal of some late-successional dependent wildlife species through the watershed. Early to mid seral stands now dominate the forest structure in the lower half of the watershed. The number of stands dominated by large pine (sugar pine, western white pine, and ponderosa pine) has been substantially reduced from historic levels. Harvesting, combined with fire suppression, has reduced the potential of obtaining large pine due to the establishment and dominance of shade tolerant species in the understory (white fir). Protection buffer wildlife species (as defined in the Northwest Forest Plan's "Standards and Guidelines") and the bald eagle are dependent upon large pine. Populations of special status plant species, other plant species of concern, and plant communities of interest, appear to be stable. Populations of noxious weeds are increasing slightly in disturbed areas.

White pine blister rust (*Cronartium ribicola*) and the fir engraver beetle (*Scolytus ventralis*) appear to be the two most impacting diseases and insects within the watershed. Annous root rot (*Fomes annous*) and western and mountain pine beetles (*Dendroctonus spp.*) are impacting some areas as well. Snag and downed log requirements on federal land as stipulated in the "Standard and Guidelines" currently exist in most areas on and in many areas exceed the requirements. However, the level of snags and downed logs in the lodgepole pine community may be affected by ongoing firewood cutting. In the Mountain Lakes Wilderness and vicinity, slow changes in seral-stage composition, fuel loading, species composition, and structure may be occurring due to fire suppression.

Currently there are 290 miles of roads in the watershed which equals approximately 4 miles per square mile. In most areas, this density exceeds the 1.5 mile per square mile recommendation of the Spencer Creek Coordinated Resource Management Plan and both Forest Service and Bureau of Land Management Resource Management Plans. The high density of roads is contributing to the excess levels of sediment in Spencer Creek. There are 150 road crossings and 23 miles of road within 100 feet of stream channels within the watershed. Roads and areas of compaction decrease soil productivity, prolong the vegetative recovery process and increase runoff potential. The density of roads also exceeds the recommended level for several wildlife species of concern, including deer and elk.

The riparian zone condition in Spencer Creek is influenced by timber harvest, grazing, and road building in the forest environment. Problems related to cattle grazing are primarily within riparian, meadow, and other wetland areas. Road densities and harvest have reduced near term large woody debris recruitment and stream side canopy closure in many areas. In addition, there has been an increase in the amount of solar radiation and stream warming due to a reduction in shading and an increase in sediments. The conversion of the 1,500 acre Buck Lake to irrigated grazing pasture greatly modified the largest wetland in the watershed. Similarly, in unconfined reaches of Spencer Creek and

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wet meadow environments, grasses, forbs, and willows have been impacted in some areas due to grazing. Forage in upland areas is underutilized because of the distribution of water and livestock. Springs, wet meadows, and other stillwater habitats are very limited in the Spencer Creek watershed. The draining of Buck Lake is the most significant loss of wetland habitat in the system. Wildlife species which could be affected by these changes include one of three known populations of the spotted frog in the Klamath basin, other amphibians, the great gray owl, marten, deer, and over 100 vertebrate species associated with riparian or wetland habitats.

The mainstem of Spencer Creek is influenced by the net effect of activities in the stream, forest, and riparian environment and past removal of large wood debris from the channel. Roads are routing water and sediment from the upslope environment to the channel environment. Likewise, ditches and canals in Buck Lake route water with elevated temperatures and levels of sediment into the mainstem of Spencer Creek. Logging has reduced the late seral stage composition by approximately 30 percent along the stream corridor. Spencer Creek and associated tributaries frequently do not meet State of Oregon Water Quality Standards for salmonid bearing streams of the Klamath Basin. Spencer Creek may continue to exceed maximum summer water temperatures above 58 degrees Fahrenheit (ODEQ Standard) because the mainstem originates as outflow from a shallow wetland area (Buck Lake). Poor water quality and lack of cold water habitat could cause a decline in intolerant species with a resulting shift in the community structure toward those species tolerant of warm water and simplified habitat structure. Based on macroinvertebrate community indicators, impacts are apparent from high summer water temperatures and fine sediment in Spencer Creek. These factors negatively affect the biotic and habitat integrity of Spencer Creek and influence the distribution and abundance of invertebrates and those fish that are dependent on invertebrates as a food source. Recent implementation of

some of the recommendations contained in the Spencer Creek Coordinated Resource Management Plan (1994) and the Weyerhaeuser Company Watershed Analysis (1994) should reverse a downward trend in aquatic habitat quality.

The loss of wetland function and the road system design are the mechanisms of change that are most influential in altering run-off patterns. Associated with the loss of wetlands is the ability to attenuate peak discharge. The ability to store water for slower releases throughout the summer months has decreased due to the draining of Buck Lake. Concurrently, the design of the road system has resulted in water being routed into the stream channel. The net effect is more efficient delivery of water into the channel system. These activities have a high probability to increase peak flow. Similarly, the timing of peak flow most likely occurs earlier in the year than it did historically. Baseflows have likely decreased with the loss of wetland function and the withdrawal of water for irrigation at Buck Lake. The presence of pools has been decreased in confined reaches primarily due to the removal of wood.

Three changes in habitat condition were determined to be chronic and problematic for native fish in Spencer Creek; fine sediment, high temperature, and low flows. The significant causal mechanisms for reduced habitat quality are road crossings, stream-side timber harvest, and channelization and grazing at Buck Lake. Observed changes in fish communities over time indicated that the number of species adapted to simplified habitat structure are increasing. Restoration projects and management recommendations in this document, the Spencer Creek Coordinated Resource Management Plan, and the Weyerhaeuser Company Watershed Analysis is intended to improve riparian and stream conditions and specifically address sedimentation, water temperature, and flow issues.

Desired Future Conditions

Recommendations to achieve desired future conditions are listed in Tables B and C as restoration opportunities and management considerations and recommendations. Monitoring concerns and information needs are addressed in Table D.

Desired future conditions for the Spencer Creek watershed are:

- maintain and encourage mid to late seral stage forest connectivity;
- improve wetland function at Buck Lake, and riparian habitat;
- reduce tree mortality from fire/insects/disease.
- encourage and enhance the large pine tree component; and
- improve water quality and stream flow
 - decrease stream temperatures and fine sediment input.

Table A. Some Vital Statistics of the Spencer Creek Watershed (All numbers are approximate)

	Acres	Percent
Federal Land in Watershed	30,852	(57%)
Private Land in Watershed	23,310	(43%)
Total Acres	54,162	
Forest Plan Allocations		
Administrative Withdrawal (Wilderness)		11%
Late Successional Reserves		33%
Riparian Reserves		3%
Matrix		33%
Vegetation		
1899 Leiberg Mid and Late Seral Stage		60 to 70%
1899 Leiberg early seral stands as a result of fire		10 to 20%
1945 Mid and Late Seral Stage		60%
1994 Mid and Late Seral Stage		35%
%Federal Lands in Late Successional Habitat		25%
%All lands (Federal and private) in Late Successional Habitat		15%
Tree canopy closure between 11 to 55%, percent of the watershed		67%
Tree canopy closure greater than 55%, percent of the watershed		22%
Shrub canopy closure in the watershed		11%
	Number	
Lightning starts per year [Highest Year (1987) 18 starts]	3 to 4	
Human starts per year [Highest Year (1983) 6 starts]	1 to 2	

Table B. Restoration Project Opportunities - High Priority/Red Flag Items

Restoration Opportunity	Concern/Objective	Cooperative Agreements
1. Construct security fencing around Spencer Creek Cemetery.	The Cemetery has been badly vandalized.	Yes-Weyco
2. Restore the wetland function of Buck Lake (CRMP initiated project) through fencing and cross fencing (up to 10 miles of fencing). Implement a grazing system and reseed/replant dikes and channels in and below Buck Lake with native seed/species. Improve/install headgates and culverts. Reduce duration of low flow periods.	Decrease sediment and nutrient input from Buck Lake into Spencer Creek. Decrease water temperatures.	Yes-Hugh Charley, NRCS (formerly SCS), ERO and the Spencer Creek CRMP ¹ group.
3. Short Term: Build enclosure fencing around specified USFS riparian areas including Desolation Swamp, unnamed area in the vicinity of Buck Lake, and Muddy Springs and develop off-site watering facilities.	Short Term: Enhance control of livestock use over important riparian areas and increase the use of underutilized upland areas. Address adverse grazing impacts on habitats and species at risk.	Yes-Hugh Charley, USFS, and Weyco.
Long Term: Implement the rest rotation grazing system outlined in the USFS "Range Analysis Narrative". Up to 24 miles of fencing would be needed to implement this system.	Long Term: To implement the recommendations of the "Range Analysis and meet the growth requirements of critical riparian and meadow plant communities.	None identified.
4. Address adverse recreation impacts through the following: decrease OHV/ATV use above the mouth of Spencer Creek by closing and rehabilitating inappropriate ATV/social trails and roads; and discourage inappropriate camping along streams and restore impacted areas through road closures and rehabilitation	Decrease fine sediment input into streams.	Yes-Weyco.

¹See Appendix 8 for more information on the Coordinated Resource Management Plan.

Table B. Restoration Project Opportunities - High Priority/Red Flag Items (Continued)

Restoration Opportunity	Concern/Objective	Cooperative Agreements
5. Thin forested communities mechanically and/or with prescribed fire to reduce stand densities. Place emphasis on drier sites, south-facing slopes, and the lower portion of the mixed conifer zone.	Maintain, enhance, and/or restore the existing pine component in the vegetative communities once dominated by one species and are presently dominated by shade tolerant species (such as white fir). Improve the currently poor recruitment potential for ponderosa pine and address the associated long-term wildlife pine habitat dependency problems.	Yes-Weyco is already intensively pursuing these thinning treatments.
6. Close and/or obliterated roads, OHV/ATV trails, and skid trails to reduce road densities toward the goal of 1.5 miles per square mile. Reduce the number of roads crossing streams and obliterate roads paralleling streams within 100 feet of the stream channel.	Reduce fragmentation of habitat and disturbance to many wildlife species, including deer, from high road densities. Reduce sediment delivery to streams, increase stream shading and increase the large woody debris input potential.	Yes-Weyco.
7. Place large woody debris structures in those confined channel reaches that lack coarse structure and have low potential for short-term recruitment of large woody debris.	Increase the amount of coarse structure in confined reaches to dissipate stream energy and create pool habitat.	None identified.

Abbreviations used in this table:

ATV	=All-Terrain Vehicle	CRMP	=Coordinated Resource Management Plan	USFS	=Forest Service	OHV	=Off-Highway Vehicles
DBH	=Diameter at Breast Height	ERO	=Ecosystem Restoration Office	NWFP	=Northwest Forest Plan	Weyco	=Weyerhaeuser Company
LSR	=Late-Successional Reserve	NRCS	=Natural Resource Conservation Service (Formerly the Soil Conservation Service)				

Table C. Management Considerations for Future Project and Program Planning - High Priority/Red Flag Items

Management Recommendation	Concern/Objective	Design Features
<p>1. Develop the rest-rotation grazing system as recommended in the USFS "Range Analysis Narrative" for the Buck Allotment and, if feasible, include the BLM's Buck Lake Allotment. Develop Allotment Management Plans for these allotments.</p>	<p>Provide livestock control and management to meet meadow and riparian utilization and condition objectives; and to increase use of the under-utilized upland areas.</p>	<p>Construct up to 24 miles of fencing to divide the Buck Allotment into 7 pastures. Implement a 2 herd, 7 pasture rest-rotation system. Include BLM's Buck Lake Allotment into the rotation if feasible.</p>
<p>2. Provide Enhanced law enforcement, educational efforts and OHV closures to protect resources and control inappropriate behavior at the mouth of Spencer Creek and control unauthorized firewood cutting elsewhere.</p>	<p>Protect riparian resources and address public concerns about uncontrolled recreation and illegal activities.</p>	<p>Develop a cooperative law enforcement contract with Weyco and PP&L for use of Reserve Deputies on weekends. Develop a site specific plan for the area around the mouth of Spencer Creek to address resource damage, educational needs, and law enforcement efforts. Continue Oregon State Forestry fire patrols in summer.</p>
<p>3. Short Term: Focus harvesting activities in residual early-mid and mid seral stage forests in the Matrix.</p> <p>Long Term: Conduct thinning and light underburning projects to achieve fuels and forest management objectives. Through thinnings and underburning, control densities and species composition to meet stand-specific objectives.</p>	<p>Enhance the sustainability of some existing forest communities in the watershed.</p>	<p>Reduce fuel loads to natural levels. Reduce stand densities, particularly in areas where understory densities are competing with overstory component and where the overstory component and needs to be retained. Increase the composition (percent) and vigor of shade-intolerant species (especially pines). Thinning and removal of material must include the smaller diameter classes (2 to 8 inches dbh). Give higher priority to treatment of drier sites, south slopes, and in the lower portion of the mixed conifer zone.</p>

**Table C. Management Considerations for Future Project and Program Planning
- High Priority/Red Flag Items (Continued)**

Management Recommendation	Concern/Objective	Design Features
4. Enhance, maintain, and restore the ponderosa, sugar, and western white pine component wherever feasible.	Address reductions in these species from past harvesting. Protect remaining stands where threatened by dense stands of shade tolerant species (except in plantations). Address the loss of habitat for wildlife species dependent upon large ponderosa pine.	Reduce stand densities around residual natural stands of pine in the watershed. During thinning treatments, retain and enhance the pine component where shade tolerant species predominate.
5. Manage lands north or south of Buck Lake as a connector for late-successional dependent wildlife and to optimize the use of unmapped Late Successional Reserves. Consider adoption of Corridor 3 as the preferred option; Maintain the opportunity for providing connectivity where the potential is the greatest.	Provide habitat connections between Late-Successional Reserves that are not being provided by Riparian Reserves. The Riparian Reserves are disjunct due to private ownership and run north/south. Desired connectivity pathways would be most beneficial in an east/west direction.	Develop a corridor with a minimum width of 600 feet. Maintain at least 40 percent of the forest with connectors in late-seral condition (50 to 60 percent canopy closure) and the remainder in mid-seral condition with at least 40 percent canopy closure. Place logs in deficient areas. Close or obliterate unnecessary roads. Minimize the disturbance to wildlife from planned snowmobile trails in the vicinity of corridors by implementing specifications listed in the Management Recommendations chapter.
6. Develop a comprehensive road management plan for the watershed across all ownerships.	Reduce fragmentation of wildlife habitat and disturbance to wildlife from high road densities. Reduce sediment delivery to streams and increase stream shading.	Close and/or obliterate roads to reduce density, especially in high impact areas. Establish Transportation Management objectives as specified in the NWFP.
7. Consider thinning and prescribed fire in Riparian Reserves to meet Aquatic Conservation Strategy objectives.	Reduce the risk of fire and stand densities and improve the health of forested riparian areas.	Treatment must meet Aquatic Conservation Strategy Objectives. Treatment objectives would address mostly trees 3 to 18 inches in diameter.

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LSR	- Late Successional Reserve	NRCS	- Natural Resource Conservation Service (Formerly the Soil Conservation Service)			PP & L	- Pacific Power and Light

Table D. Information and Monitoring Needs - High Priority/Red Flag Items

Information/Monitoring Need	Concern/Objective	Why	How
1. Monitor forage utilization and physical impacts from livestock in riparian areas periodically throughout the grazing season.	Improve long term conditions and functionality of important meadow and riparian areas.	Ensure that agency utilization objective standards are not exceeded.	Follow respective agency methods and procedures for the establishment and reading of range monitoring studies.
2. Monitor insect activity, particularly mortality caused by the fir engraver.	Assess the level of activity, which appears to be increasing with the increase of shade tolerant true fir in forested stands.	Assess uncontrollable habitat change that could be occurring in late successional habitat in the Matrix and in LSRs, with corresponding adverse impacts to wildlife.	Conduct stand exams and yearly aerial monitoring flights done by ODF and the USFS.
3. Monitor disease activity, particularly annosus and blister rust.	Assess apparent increased incidence of these diseases.	Assess declining forest health and resiliency.	Conduct stand exams and establish control plots.
4. Monitor livestock use in riparian, wetland, and spring areas after short-term restoration or long-term grazing management is implemented.	Improve the condition of plant communities and riparian, wetland, and spring-associated wildlife populations.	Monitor the effectiveness of restoration and/or grazing management changes.	Track movements of livestock on a weekly basis to monitor the effectiveness of changes in grazing management. Check fenced sites periodically throughout the season to ensure that fenced exclosures are functioning as designed.
5. Survey for Survey and Manage species (animals, plants, amphibians, molluscs, and fish) listed in the NWFP.	Verify the existence of species that are likely to occur in the watershed.	Implement requirements of the NWFP.	Follow survey protocols. Conduct spawning redd count surveys to monitor redband trout.

Table D. Information and Monitoring Needs - High Priority/Red Flag Items (Continued)

Information/Monitoring Need	Concern/Objective	Why	How
6. Determine and/or verify classifications for streams in the watershed (perennial, intermittent, and ephemeral; fishbearing and non-fishbearing).	Update existing delineations to reflect actual on-the-ground conditions.	Apply Riparian Reserves and the Aquatic Conservation Strategy.	Survey for each project area. Update GIS and stream maps.
7. Monitor harvest prescriptions within the matrix to determine if owl dispersal conditions are being met.	To verify the assumption that the dispersal habitat needs of the northern spotted owl will be met through the green tree retention requirements in the Northwest Forest Plan.	To fulfill the federal agency obligation to the U.S. Fish and Wildlife Service under the Endangered Species Act, and the obligation under Agency Resource Management Plans.	Based on biologists' judgment of adequate dispersal condition, evaluate the quantity and size of downed woody material for adequate prey base opportunities, and cover for protection and movement.
8. Evaluate the percentage and arrangement of suitable spotted owl dispersal habitat available within the time period harvest is planned for a given area (e.g. subwatershed) to determine the type of harvest prescription and the area which could be harvested while maintaining adequate dispersal conditions	To evaluate if the dispersal needs of the owl are being met within the watershed.	To fulfill the federal agency obligation to the U.S. Fish and Wildlife Service under the Endangered Species Act, and the obligation under BLM's Resource Management Plan and the Winema National Forest's Land and Resource Management Plan.	Evaluate future harvest plans, stand inventories, aerial photographs and/or Pacific Meridian Resources data.

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