

Current Conditions

Introduction

From a federal agency perspective, the purpose of a watershed analysis is to provide federal agencies a comprehensive and systematic analysis to guide planning and management of federal lands within the watershed. It is intended to guide planning and land management activities to successfully meet the intent of the *Northwest Forest Plan* (NFP) as it applies to federal lands in the watershed. The intent of the Upland Terrestrial Systems and Human Uses narratives for the North Santiam Watershed is to supplement the contractor's work to meet the federal requirements for watershed analysis.

Watershed analysis is ecosystem analysis at the watershed scale. It is a principal means used to meet ecosystem management objectives identified in the *Northwest Forest Plan Record of Decision for Amendments to Forest Service and Bureau of Land Management Planning Documents Within the Range of the Northern Spotted Owl* (USDA, USDA 1994) the *Salem District Resource Management Plan/Final Environmental Impact Statement* (RMP). Through watershed analysis, a common framework for evaluating and managing the federal land within the landscape can be established. The watershed analysis will serve as a framework for developing site-specific proposals, monitoring and restoration needs on federal lands. The analysis will also be used in making sound resource management decisions for federal lands contained within the watershed.

Watershed analysis is an ongoing and dynamic process. It will be revised and updated as conditions, assumptions, or resource plans change and new information becomes available. Watershed analysis is **not** a decision-making process. It is a stage-setting analytical process that offers constraints and provides guidance for future management decisions.

For the purposes of this analysis, the Analysis Area is defined by two fifth field watersheds, the Lower and Middle North Santiam Watersheds. Information on vegetative conditions was derived from a variety of sources. BLM Forest Operations Inventory (FOI) records were used to depict vegetative conditions on BLM lands. Estimates of vegetative cover and stand conditions on BLM lands are expressed as existing in the summer of 2000. Vegetative condition on FS, state, and private lands was determined from satellite imagery using the Western Oregon Digital Imagery Project (WODIP). Estimates of vegetative cover and stand conditions on non-federal lands are expressed as existing during the summer of 1997. This information was developed for the evaluation of seral stage distribution and habitat conditions across the Analysis Area. Harvest and other management activities conducted since then were not evaluated in this analysis.

Upland Terrestrial Systems

The Setting

For the purposes of this analysis, the Analysis Area is defined by the Lower and Middle North Santiam Watersheds. The Analysis Area is approximately 130,520 acres. About 90 percent of the Lower North Santiam Watershed is located within the Willamette Valley Physiographic Province and the remainder is within the Western Oregon Cascades Physiographic Province. The Middle North Santiam Watershed is contained entirely within the Western Oregon Cascades.

Elevations within the Analysis Area range from 100 feet at the confluence of the Santiam River with the Willamette River, just north of the city of Albany, to Rocky Top (5,014 feet) and Monument Peak (4,725 feet), the highest peaks, located on the east end of the Analysis Area. The Analysis Area is bordered by Looney Butte, Stayton Hills, Fern Ridge, Gates Hill, and Mount Herob on the north; Rocky Top, Big Cliff Dam, and Monument Peak on the east; and High Rock, Tom Rock, McCully Mountain and Scrael Hill on the south. The Analysis Area includes the communities of Jefferson, Stayton, Lyons, Mill City, and Gates, and contains the North Santiam River Corridor.

The Analysis Area consists of two fifth field watersheds, the Lower North Santiam and the Middle North Santiam. The Lower North Santiam was stratified into five sub-watershed basins (SWBs). The Middle North Santiam was stratified into four SWBs. The two watersheds and their SWBs are delineated on Maps 1A/B, Sub-Watershed Basins. Major drainages within the Analysis Area include Marion, Bear Branch, Stout, Shellburg, Cherry, Minto, Packsaddle, Bad Banks, Snake, Rock, Little Rock, Mad, Little Sardine, and Sevenmile Creeks. Approximately 51 percent of the Analysis Area is located in the Willamette Valley Physiographic Province. The remaining 49 percent is in the Western Oregon Cascades Physiographic Province. Federal lands in the Analysis Area are managed primarily by the Bureau of Land Management (BLM), with minor amounts managed by the Forest Service (FS). The area of each watershed and percentages of the total Analysis Area are displayed in Table 1-1, below.

Table 1-1 The Lower and Middle Santiam Watersheds by Ownership Acres and Percent.

Sub-Watershed Basin/Watershed	Federal Acres (% of WA)	Non-Federal Acres (% of WA)	Total Acres (% of AA)
Lower (Chehulpum)	0	21,704	21,704
Middle (Marion)	0	14,583	14,583
Bear Branch	100	16,130	16,230
Upper (Valentine/Trask)	269	13,643	13,912
Stout Creek	663	6,730	7,393
Lower North Santiam TOTALS	1,032 (1%)	72,790 (99%)	73,822 (57%)
Lower (Fox Valley)	2,115	15,892	18,007
Middle (Mad Creek)	2,237	11,208	13,445
Rock Creek	1,304	10,968	12,272
Upper (Sevenmile)	1,120	11,854	12,974
Middle North Santiam TOTALS	6,776(12%)	49,922 (88%)	56,698 (43%)
Grand Totals (Lower/Middle Combined)	7,808 (6%)	122,712(94%)	130,520(100%)

Terrestrial

Vegetation Patterns

Currently, 38 percent of the Analysis Area are conifer types consisting mostly of Douglas-fir and western hemlock. About 51 percent consists of urban/rural residential, agricultural lands and roads, primarily in the Willamette Valley (western) portion of the Analysis Area. In the lower elevations and along the riparian areas are hardwood and mixed types consisting of red alder, bigleaf maple, hemlock and fir, with minor components of ponderosa pine, incense cedar, Oregon white oak and Oregon ash that comprise about nine percent of the watershed. The remaining two percent consists of non-forest types such as water, meadows, rock cliff/talus, and other natural openings in the forest environment.

A joint FS/BLM plant association modeling project has recently been completed in draft form. It extends into non-forested lands along the foothills of the valley. As a result, the lower portion of the Analysis Area (Lower North Santiam) that is non-forested has plant association data coverage. The modeling uses slope, slope position, aspect, elevation, and precipitation, and incorporates field plots to estimate the potential for forests to develop on the land. Therefore, although the photo interpretation data records indicate 53 percent as non-forest, the modeling project data records 20 percent. The other 80 percent of the Analysis Area can be stratified into four plant association groups: Douglas-fir, grand fir, western hemlock (moist and dry sub-series) and Pacific silver fir. Plant associations describe the potential dominant plant community (a combination of tree and shrub and/or herb layers) that would inhabit a site over time, in the absence of any disturbance (Hemstrom and Logan 1986). A plant association defines a biological environment in terms of species' composition, productivity, and response to management. Knowledge of the presence and distribution of indicator understory species further refines the biological environment, allowing more accurate assessment of site potential.

Plant associations with similar attributes have been aggregated into groups. The plant association group of western hemlock has been arranged into "sub-series" based on the broad environmental conditions in which hemlocks are found. This is a key stratification to identify the range of structural and compositional characteristics that can be expected under natural conditions on a given site. Table 1-2 characterizes the relationship between series, environment or sub-series environments, and plant associations found in the Analysis Area.

In the Lower North Santiam, Douglas-fir is the most dominant series present, occurring on 48 percent of the watershed. There are also grand-fir plant associations occurring on 8 percent and western hemlock associations at the higher elevations with 24 percent. The other 20 percent is non-forest land.

In the Middle North Santiam, western hemlock is the most dominant series present, occurring on 81 percent of the watershed. Four percent is in the grand fir and 13 percent in the silver fir series. Another two percent is composed of Douglas-fir, grand-fir and mountain hemlock at the highest elevation.

In addition, mixed hardwood stands consisting mostly of big leaf maple, red alder with some Oregon white oak, Oregon ash and black cottonwood comprise a minor component at low elevations and in riparian zones of the North Santiam River.

Table 1-2 Plant Association Series, Sub-Series, & Indicator Species in the Analysis Area.

Series	Sub-Series or Environment	Understory Indicator Species Groups in Plant Associations
Douglas-fir	Low to mid-elevation on the driest environments supporting forest; these stands can grade into woodlands of Douglas-fir, Oregon white oak and pines.	vine maple; ninebark-dwarf Oregon grape; dwarf Oregon grape-swordfern-ninebark; ninebark-whipple vine; ninebark- grass; snowberry
Grand-fir	Low to mid-elevation on dry sites near the valley bottom; these stands can grade into Douglas-fir at the lower elevations and hemlock higher.	Ninebark-swordfern, salal, dwarf Oregon grape, big-leaf maple
Western Hemlock	Warm and Moist - More moisture than the Douglas-fir or Grand-fir zones. This area is warm, moist, productive; near riparian areas, toe slopes and up to mid slopes at low elevations.	dwarf Oregon grape/oxalis; Oregon oxalis; swordfern; twinflower; salmonberry-swordfern; foamflower; salmonberry-oxalis
Western Hemlock	Well-drained, dry - Mid to upper slopes in low elevations.	dwarf Oregon grape; dwarf Oregon grape-salal; rhododendron-dwarf Oregon grape; rhododendron-salal; rhododendron/twinflower; vanilla leaf; dwarf Oregon grape/vanilla leaf; twinflower; rhododendron-Alaska huckleberry/dogwood bunchberry; rhododendron/beargrass
Pacific Silver Fir	Mid to upper elevations where cooler temperatures and persistent snow packs shorten the growing season.	vine maple/coolwort foamflower; Oregon oxalis; coolwort foamflower; rhododendron-Alaska huckleberry/dogwood bunchberry; Alaska huckleberry/dogwood bunchberry; big huckleberry/beadlily; rhododendron-dwarf Oregon grape; big huckleberry/beargrass; rhododendron/beargrass

Seral Stages

Seral stage is an important component in describing the overall structure of the vegetation and patterns across the Analysis Area. On BLM lands, age class distribution was categorized into age class bands corresponding to vegetative seral stage development. On FS and non-federal lands, the WOODIP data yielded size classes which were correlated to seral stages. See Table 1-3, Seral Stage Definitions for Lower/Middle Santiam Watersheds; Maps 5A/B, Seral Stages, and Figures 1-1, 1-2, & 1-3, Seral Stage Amounts by Ownership.

Table 1-3 Seral Stage Definitions for Lower/Middle North Santiam Watersheds.

Seral Stage	Tree Age Class (BLM lands)	Size Class	Tree Size Class (FS & non-federal lands)
Open/Grass/Forb	0 to 10 years	0	0
Open sapling/brush	10 to 40 years	1	less than 10 inches DBH
Closed Sapling	40 to 80 years	2	11 to 20 inches DBH
Mature	80 to 200 years	3	21 to 30 inches DBH
Old-growth	greater than 200 years	4	greater than 30 inches DBH

Seral Stage	Acres
Old-growth	198
Mature	2,609
Closed Sapling	2,975
Open Sapling/Brush	839
Early-Grass/Forb	787
Non-forest	400

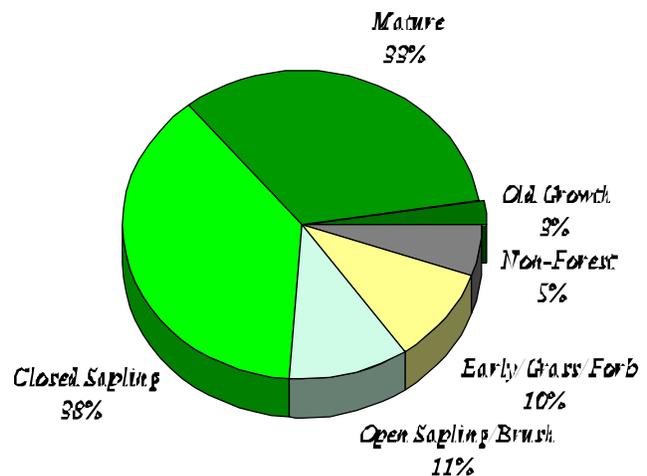


Figure 1-1 Seral Stage for Federal Ownership.

Seral Stage	Acres
Old-growth	59
Mature	9,109
Closed Sapling	29,027
Open Sapling/Brush	1,544
Early-Grass/Forb	14,322
Non-forest	68,651

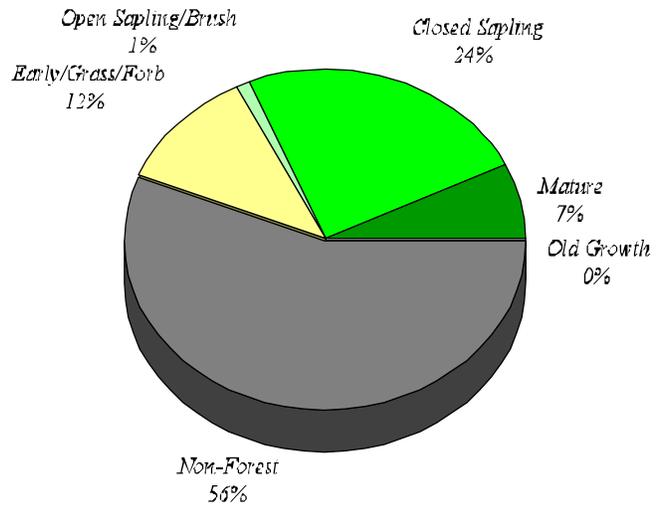


Figure 1-2 Seral Stage for Non-Federal Ownership.

Seral Stage	Acres
Old-growth	257
Mature	11,718
Closed Sapling	32,002
Open Sapling/Brush	2,383
Early-Grass/Forb	15,109
Non-Forest	69,051

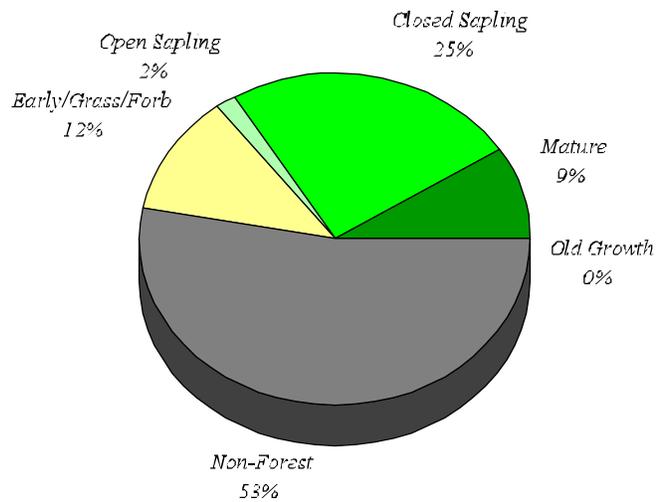


Figure 1-3 Seral Stages for All Lands.

Mature and old-growth forest are considered to be late successional forest habitat (late successional). Late successional comprises about three percent of the Lower North Santiam Watershed and 17 percent of the Middle North Santiam Watershed. For the two watersheds combined, nine percent is late successional. Acres of late successional in the Lower/Middle Santiam Watersheds was further broken down by ownership and sub-watershed basin. In the Lower North Santiam Watershed, 77 percent of the late successional is located in the Stout Creek SWB. In the Middle North Santiam Watershed, 60 percent are in the Middle (Mad Creek) and Rock Creek SWBs.

Seral stage amounts and distribution on federal lands was further analyzed and categorized by Land Use Allocation (LUA). See Table 1-4, Seral Stage Acreage on Federal Lands by LUA in the Lower/Middle North Santiam Watersheds. The most common LUAs in the Analysis Area are General Forest Management Area (GFMA), and Connectivity (CONN), comprising 57 percent and 35 percent, respectively. There are 123 acres (<2 percent) of Late- Successional Reserve (LSR) in the Analysis Area. Sixty-four percent of the LSR is late successional forest habitat compared with 35 percent in CONN, and 37 percent in GFMA. Late successional forest habitat comprises 36 percent of the federal ownership in the Analysis Area. Three percent of the federal ownership is old-growth forest, more than 200 years of age. Seventy-seven percent of the old-growth in the Analysis Area is on federal lands.

Table 1-4 Seral Stage Acreage on Federal Lands by LUA in the Lower/Middle North Santiam Watersheds.

Seral Stage	BLM GFMA	%	BLM CONN	%	BLM LSR	%	FS Matrix	%
Early/grass/forb	430	10%	176	6%	1	1%	180	36%
Open Sapling/brush	453	10%	343	13%	32	26%	11	2%
Closed Sapling	1,793	40%	961	36%	8	7%	213	42%
Mature	1,664	37%	817	30%	29	23%	99	20%
Old-Growth	2	<1%	146	5%	50	41%	0	0%
Non-forest	135	3%	261	10%	3	2%	1	0%
Totals	4,477	100%	2,704	100%	123	100%	504	100%

Late Successional Habitat Quality

Harvest patterns and natural disturbance in the past have created a mosaic of seral stages across the Analysis Area. Where a late successional patch is surrounded by younger age classes, the edges of the patch exhibit environmental conditions that are different from the interior of the patch. As the amount of open area and edge increases, habitat quality declines for species associated with late successional forests and improves for species that are associated with edge and open areas.

Overall, the quality of late successional forest habitat in the Lower/Middle Santiam Watersheds is impaired by fragmentation caused by past harvest activity throughout the Analysis Area. The highest quality late successional forests are located on BLM lands in Snake, Cherry, Packsaddle, Rock and Little Rock Creeks.

Landscape Structure

The structure and pattern of vegetation or habitats within an ecosystem such as a watershed can be characterized in terms of patches, corridors, and a background matrix. The patterns of patches, matrix, and corridors strongly influence the ecological characteristics and habitat across a watershed.

The term 'matrix' in landscape ecology is defined as the most connected portion of the landscape, the vegetation type that exerts the most control over landscape function. Patches are definable vegetative types that differ in their habitat characteristics from their surroundings. Patches vary in size, shape, type, heterogeneity, and the vegetative types that surround them (Diaz and Apostol 1992).

In the Willamette Valley portion of the Lower North Santiam Watershed, agricultural/rural/urban types are very dominant. The western edge of the Cascades Physiographic Province begins in the upper reaches of Stout and Upper SWBs of the Lower North Santiam Watershed, in the vicinity of the communities of Lyons and Mehama. Here, there are fairly equal amounts of recently harvested open areas in early successional stages, closed sapling stands averaging 40 to 70 years of age, and agricultural/rural/urban types.

The Middle North Santiam Watershed extends from Lyons and Mehama east to Big Cliff Dam. The North Santiam River Corridor is a dominant feature of the Middle North Santiam, bisecting the watershed from the west to the east. The river corridor begins to become well defined in the Fern Ridge/Stout Mountain area in the Upper SWB of the Lower North Santiam Watershed. Agricultural/ rural/urban areas, including the communities of Gates and Mill City, dominate the river corridor. Closed sapling stands 40 to 70 years of age dominate the uplands both to the south and the north of the river corridor. Patches of mature and fragments of old-growth are scattered and discontinuous, comprising about 17 percent of the Middle North Santiam Watershed. The successional stage distribution in the Analysis Area follows a general harvest pattern beginning in lower to upper elevations, over time.

The drainages and their associated riparian/streamside vegetation provide corridors for wildlife movement. They flow from the eastern higher elevations through the watershed, west to the Willamette Valley Province. The higher elevation ridge top areas connecting the peaks of the watershed also serve as corridors for movement. Migration patterns of the more mobile species is from lower to higher elevations in the spring and back to lower elevations in the fall/winter. This corresponds to a fairly well defined east/west migration pattern through the Analysis Area, along North Santiam River Corridor.

North of the Lower/Middle North Santiam are Mill Creek, Abiqua Creek and the Little North Fork of the Santiam watersheds. The northeast boundary of the Lower North Santiam borders Silver Falls State Park, which is located in the Abiqua Creek Watershed. To the south of the North Santiam are Thomas, Crabtree, and Hamilton Creek watersheds, which are primarily low elevation watersheds in the foothills of the Cascades. To the east, are the Blowout/Detroit, Upper North Santiam, and Breitenbush watersheds, which are part of the predominant north-south LSR/wilderness network which comprises the backbone of the Cascades Mountain Range. The Cascade Crest is approximately 22 miles to the east of the Middle North Santiam Watershed.

The western portion of the Analysis Area and immediately to the west is the Willamette Valley floor. Connectivity is effectively cut off and the Willamette Valley acts as an effective barrier for many wildlife species. The Analysis Area exhibits ecological characteristics of the Cascades Mountain Range as well as remnant habitats characteristic of the Willamette Valley, such as white oak savannah and grasslands.

Special Habitats

Special habitats are usually native non-forest types such as meadows, wetlands, rock outcrops, cliffs, and talus slopes. They greatly contribute to the overall biodiversity across the landscape and are important for plants and wildlife. Two significant special habitat complexes are located in the Lower/Middle North Santiam watersheds. They are Stout Mountain and the Monument Peak area. Other special habitat features are found scattered throughout the Analysis Area. Among them are Lyons wetlands and Kingston Prairie.

Stout Mountain is located 20 miles east of Salem in the Stout and Upper (Valentine/Trask) SWBs. This mountain rises to an elevation of 1,382 feet above the Willamette Valley floor. It is approximately 700 acres in size and contains a number of native habitats characteristic of the Willamette Valley. On top of the mountain is an oak savannah and grassland. On the south face are steep cliffs, rock outcrops, and talus slopes; interspersed with oak savannah and dry hillside meadows. At the base of the mountain on the south side, is a large wetland/high water area, a sphagnum bog, springs, and rock outcrops. The mountain and its surrounding base is forested with a diverse variety of species including grand fir, Douglas-fir, western redcedar, western hemlock, big-leaf maple, red alder, Oregon ash and Oregon white oak. Incense cedar is a major component of the forest here, and there are a number of old-growth groves of incense cedar and Douglas-fir. The mountain is privately owned and surrounded by multiple non-industrial private landowners, managing lands primarily for Christmas trees and grass seed. The presence

of such a diversity of habitats in close proximity, including old-growth Douglas-fir and incense cedar in the Willamette Valley, is unique.

The Monument Peak area is located on the southeastern edge of the Middle North Santiam Watershed on BLM, State, and private lands. In the vicinity of Monument Peak and adjacent peaks are meadows, rock outcrops, cliffs, and numerous talus slopes/brush patches. At the base of the peaks are topographic bowls within which are wetlands, wet meadows, and ponds. To a lesser extent, these types of special habitat features are found near other peaks in the watershed, especially Mount Horeb and Rocky Top, on the northeast edge of the watershed.

Two Bird Conservation Areas (BCAs) have been identified in the Analysis Area, according to the *Conservation Strategy for Landbirds in Lowlands and Valleys of Western Oregon and Washington* (American Bird Conservancy, Appendix C, March 2000). They are the Kingston Grassland BCA and the North Santiam River Riparian BCA. The purpose of the BCA concept is to focus conservation efforts on priority habitats and focal land bird species.

The Kingston Grassland BCA was identified in the Kingston area, and the surrounding area south of the city of Stayton. Within this BCA is Kingston Prairie, a native prairie about 145 acres in size, owned by the Nature Conservancy (TNC). Contained within this BCA are remnant Willamette Valley vegetation types, including grasslands and oak-shrub types, primarily on private lands. Some native Willamette Valley bird species are known to occur here, and the area is contiguous with the Richardson's Gap grassland BCA to the south of the Analysis Area in the Crabtree Creek Watershed.

A number of wetland habitats occur in the Analysis Area, the most significant of which are associated with the braided channel of the North Santiam River. The North Santiam Riparian BCA was identified along the North Santiam in the vicinity of Stayton Island on private and BLM lands. There are several secondary/side channels in this reach of the North Santiam with associated wetlands and riparian vegetation, including gallery woodlands of black cottonwood. Other reaches of the North Santiam exhibit similar characteristics, such as near the confluence at Ankeny Flats, Wiseman Island and Lyons wetlands at John Neal Memorial Park. Several small wetlands also occur in the vicinity of Fishermen's Bend on BLM and adjacent private lands.

There is one Area of Critical Environmental Concern (ACEC) in the Lower North Santiam Watershed. The North Santiam ACEC is located on BLM lands in the Upper (Valentine/Trask) North Santiam SWB and is about 32 acres in size. This isolated parcel consists of an older mixed conifer hardwood stand located within the riparian zone of the North Santiam River. Four other BLM parcels are located within the riparian zone of the North Santiam River, one at Stayton Island, one just downstream from Lyons, one just upstream from North Santiam County Park, and Fishermen's Bend. Fishermen's Bend is a major BLM recreation site.

Noxious weeds and invasive non-native plants have become serious concerns in many special habitat areas, especially those at lower elevations in the Willamette Valley such as Stout Mountain and Kingston Prairie. Scotch broom and Himalayan blackberries are particularly widespread throughout the lower elevations of the Analysis Area.

Standing Dead and Coarse Woody Debris (CWD)

Standing dead and down CWD provide essential structure and functional habitat conditions for plant and animals in each seral stage. CWD is an important pool of energy, carbon, and nutrients in ecosystems and has an impact on site productivity. Data from inventory plots and stand exams were used to estimate the amount and condition of standing dead and down CWD across the watershed. The inventory and stand exam data for the watershed show that there are very few snags in most of the younger open and closed sapling stands. Due to past harvest patterns and agriculture/rural/urban development of habitats in the Analysis Area, there is a shortage of standing dead and CWD material available for cavity dwelling wildlife species. In addition, aggressive non-native species such as starlings are abundant in the Analysis Area and compete successfully with native species such as bluebirds and swallows for scarce cavities.

Estimates of the amount and condition of down CWD were compared to the *Northwest Forest Plan* (NFP) standard of 240 lineal feet per acre of hard material more than 20 inches in diameter. The amount and condition of down CWD follows a similar pattern as standing dead material, showing a lack of good quality material in younger stands. Down CWD left from previous logging is smaller material in more advanced stages of decay.

Roads and Transportation

The existence of roads have obvious physical effects on the ecosystem. The land area taken up in roads does not contribute to forested habitats. Run off from roads causes changes in water quality that could effect aquatic and semi-aquatic vegetation and wildlife. The existence of roads causes edge effects and microclimate changes that could affect plant communities and wildlife. In addition, open roads and road maintenance activities cause disturbance effects resulting from increased traffic and human intrusion. Roads also facilitate the spread of noxious weeds and exotic species. Roads in the watershed were mapped and are shown on Maps 4A/B, Road Control. Total miles of road and road densities across the Lower/Middle North Santiam Watersheds were calculated by SWB and ownership. See Table 1-5, Road Densities by SWB and Ownership in the Lower/Middle North Santiam Watersheds.

Table 1-5 Road Densities (miles/square mile) by SWB and Ownership in Lower/Middle North Santiam Watersheds.

WA/SWB	Average Federal	Average All ownerships
Lower (Chehulpum)	0	3.2
Middle (Marion)	0	2.9
Bear Branch	0.5	3.6
Upper (Valentine/Trask)	4.8	3.8
Stout	7.1	5.6
Lower North Santiam TOTALS	5.6	3.6
Lower (Fox Valley)	5.8	6.1
Middle (Mad Creek)	4.6	5.4
Rock	4.5	4.3
Upper (Sevenmile)	4.9	5.3
Middle North Santiam TOTALS	5.0	5.4

In the Lower North Santiam Watershed, 415 miles of road on all ownerships exist. The average total road density is estimated at 3.6 miles per square mile. The highest road densities occur in the Stout and Valentine/Trask SWBs.

In the Middle North Santiam Watershed, 475 miles of road on all ownerships occur. The average road density is estimated at 5.4 miles per square mile. Road densities exceed 5 miles per square mile in all SWBs, with the exception of Rock Creek, where road densities are 4.3 miles per square mile.

Of the 890 road miles in the Lower/Middle North Santiam Watersheds, 62 miles are on federal lands (7%). Road densities on federal lands are estimated to be five miles per square mile, which is high. Road densities on federal lands are highest in the Stout and Fox Valley SWBs (more than five miles per square mile). The Valentine/Trask, Mad Creek, Rock and Sevenmile SWBs have road densities between four and five miles per square mile.

Special Status/Special Attention Species

Plants

A list of botanical species known or suspected to occur in the Cascades Resource Area was compiled using BLM botany data bases, various floras and texts, along with habitat knowledge gained through aerial photo interpretation, GIS information, and field reconnaissance. The resulting botanical species list was then cross referenced with *Rare, Threatened and Endangered Species of Oregon* (ONHP, February, 2001) and Salem District BLM's sensitive species list to determine Federal, State, BLM status of each species. Special Status Plant Species (Attachment C) which are known or could potentially occur in the North Santiam Watershed can be found in Attachment C.

Attachment C is a list of Survey and Manage Species known or suspected to occur in the Cascades Resource Area of the Salem District, Bureau of Land Management. It is based on Table 1-1 of the *Standards and Guidelines for Amendments to the Survey and Manage, Protection Buffer, and Other Mitigation Measures Standards and Guidelines* (January 2001).

There are 14 known populations of BLM special status plant species and three known survey and manage botanical species sites in the North Santiam Watershed. Most of the special status plant species known to occur in the North Santiam Watershed are restricted to the Willamette Valley Ecoregion as described in the Oregon Natural Heritage Program publication *Rare, Threatened and Endangered Plants and Animals of Oregon* (February 2001). They inhabit low elevation prairie remnants which are often restricted to roadsides. Less than one percent of the pre-European settlement valley bottom prairies remain intact (*Restoring a River of Life: The Willamette Restoration Strategy Overview* (February 2001)). Habitat loss and fragmentation are major factors contributing to these species' rarity. Other management practices including fire suppression, habitat encroachment by invasive species and herbicide use have had a negative impact on these species ability to persist in the Willamette Valley. Special Status species known to occur in the Willamette Valley Ecoregion in the North Santiam Watershed include: *Aster curtus*, *Delphinium oregonum*, *Erigeron decumbens* var. *decumens*, *Lathyrus holochlorus*, *Lomatium bradshawii*, *Mimulus tricolor* and *Sidalcea nelsoniana*. Additional species which have the potential to occur in this ecoregion are listed in Attachment C, Table 1.

***Aster curtus* Cronquist**, white-topped aster is considered threatened but not immediately imperiled globally and imperiled within Oregon. The U.S. Fish and Wildlife Service (FWS) has identified the need for additional information before it can be proposed as Threatened or Endangered under the Endangered Species Act. *Aster curtus* is Listed Threatened by the Oregon Department of Agriculture and the Oregon Natural Heritage Program. Blooming in the mid-late summer and early fall *Aster curtus* is known to occur in grasslands and prairies in the Willamette Valley. There is one known population of white-topped aster in the North Santiam Watershed. This population occurs on private land.

***Delphinium oregonum* Howell**, Willamette Valley larkspur is considered, globally and within Oregon, to be critically imperiled because it inhabits increasingly rare open prairie habitats in the

Willamette Valley. The Oregon Department of Agriculture has listed *Delphinium oregonum* as a candidate for listing as Threatened or Endangered under Oregon's Endangered Species Act and the Oregon Natural Heritage Program considers this species to be threatened with extinction throughout its range. Within the BLM's Special Status Species Program, this species falls into the Bureau Sensitive category. *Delphinium oregonum* blooms between May and June and is found in meadows and along roadsides and fencerows. There is one known population of Willamette Valley larkspur in the North Santiam Watershed. This single population is being protected on private land in the Willamette Valley.

Erigeron decumbens* Nutt. var. *decumbens, Willamette daisy - On the global scale, there is cause for the long-term concern for *Erigeron decumbens* var. *decumbens*. Within Oregon, the species is considered critically imperiled. Willamette daisy is Listed Endangered by both the FWS and the Oregon Department of Agriculture. The Oregon Natural Heritage Program considers the species to be threatened throughout its range. *Erigeron decumbens* Nutt. var. *decumbens* blooms between June and early July and is known to occupy grasslands and open places at elevations below 1,000 feet. There have been three known locations of this species in the North Santiam Watershed. One is currently being protected on private land, another population is in a roadside ditch on private land, and the third population is extirpated.

***Lathyrus holochlorus* (Piper) C.L. Hitchc.**, Thin-leaved peavine is considered imperiled globally and within Oregon. The FWS has listed it as a Species of Concern and the Oregon Natural Heritage Program has identified that it is threatened with extinction. *Lathyrus holochlorus* blooms in June and is found along Willamette Valley fencerows in loamy, moist soils. Two populations of thin-leaved peavine have been documented in the lower elevations of the North Santiam Watershed. Both of these sites are along roadsides and Scotch broom invasion has been identified as a threat to their persistence.

***Lomatium bradshawii* (Rose) Mathias & Constance**, Bradshaw's lomatium is considered to be imperiled globally and within Oregon. Bradshaw's lomatium is also Listed Endangered by both the FWS and the Oregon Department of Agriculture. The Oregon Natural Heritage Program considers Bradshaw's lomatium to be threatened with extinction throughout its entire range.

The rarest habitats for the early spring flowering Bradshaw's lomatium are in thin soils near shallow streams over basalt in Marion and Linn Counties near the Santiam River. Within *The Recovery Plan for Bradshaw's lomatium* (1993) four separate recovery areas were identified. Within each of those recovery areas, at least two *L. bradshawii* populations need to be protected and managed as necessary, to assure their continued existence, before the species can be down listed to Listed Threatened by the FWS. The North Central recovery area defined in the recovery plan includes portions of the North Santiam Watershed, which are in the Willamette Valley Ecoregion.

One moderate sized population of Bradshaw's lomatium is being protected and managed at The Nature Conservancy's Kingston Prairie Preserve. An inventory of potential habitat for Willamette Valley endemic plant species, specifically *Lomatium bradshawii*, was completed in the spring of 1994, and no new sites were found.

***Mimulus tricolor* Hartw.**, Three-colored monkeyflower is known from a single site in the North Santiam Watershed. Within the global ranking system *M. tricolor* is considered to be secure with over 100 occurrences, but there is concern about its chances of persisting over the long-term. Within Oregon, it is considered to be imperiled because there are fewer than 20 sites state-wide and its preferred habitats are becoming increasingly rare. The Oregon Natural Heritage Program considers *M. tricolor* to be threatened with extirpation within Oregon. Within the BLM's Special Status Species Program, this species falls into the Bureau Assessment category. *M. tricolor* inhabits vernal wet areas with open canopies at very low elevations. The single site in this watershed is on federal land.

***Sidalcea nelsoniana* Piper**, Nelson's sidalcea is considered imperiled, within Oregon and globally. The FWS and the Oregon Department of Agriculture have listed this species as Threatened. The Oregon Natural Heritage Program considers *S. nelsoniana* to be critically imperiled. *The Recovery Plan for the Threatened Nelson's Checker-mallow (Sidalcea nelsoniana)* was approved and signed in 1998.

Sidalcea nelsoniana generally inhabits open habitats with moist soils and is associated with other early seral plant species. There are three known sites for *S. nelsoniana* in the North Santiam Watershed. One of the sites has been plowed and the population is believed to be extirpated. The two other sites are on private property and are threatened by light competition from trees, noxious weeds, and management practices like mowing and the spraying of herbicides. No area within the North Santiam Watershed is included in the nine recovery zones identified in *The Recovery Plan for the Threatened Nelson's Checker-mallow (Sidalcea nelsoniana)* (1998).

Cimicifuga elata, Tall bugbane, is a Species of Concern found in forested areas in western Oregon, Washington, and British Columbia. More than 100 populations are documented in Oregon.

Cimicifuga elata is considered rare but not immediately imperiled globally and within Oregon. It is a candidate for listing as threatened by the Oregon Department of Agriculture under the Oregon's Endangered Species Act and is considered to be threatened with extinction by the Oregon Natural Heritage Program. *Cimicifuga elata* falls into the Bureau Sensitive category in the BLM's Special Status Species Program. Within the North Santiam Watershed, *Cimicifuga elata* could occur in both the Willamette Valley and in the lower elevations of the West Cascades Ecoregions (Attachment C, Tables 1 & 2).

In 1996, the *Conservation Strategy Cimicifuga elata: Tall Bugbane* was signed into effect by managers in multiple national forests, BLM districts, and the Army Corps of Engineers (COE) in western Oregon. The primary objective of the strategy is to maintain the viability of *Cimicifuga elata* throughout its range in Oregon on FS, BLM, and COE lands, and to prevent listing of this species as threatened or endangered by the FWS. After implementation of this conservation strategy went into effect, numerous new occurrences were identified throughout its range in western Oregon.

Cimicifuga elata, a perennial herb, occurs in small populations at moderate to low elevations in forest gaps in moist sites with well-drained soils in northern Oregon. Although populations are found within coniferous forests, deciduous tree species are nearly always present in the local overstory. One population of *Cimicifuga elata* is known to occur in the North Santiam Watershed. This single population occupies a roadside on private land in the Willamette Valley.

Bridgeoporus nobilissimus, Noble polypore fungus is both a special status and a survey and manage species. It is considered to be imperiled globally and within Oregon. The Oregon Natural Heritage Program has classified *B. nobilissimus* as threatened with extinction. Within the BLM's Special Status Species Program *B. nobilissimus* falls into the Bureau Sensitive category. This species falls into Category A under the *Northwest Forest Plan (NFP) and Standards and Guidelines for Amendments to the Survey and Manage, Protection Buffer, and Other Mitigation Measures Standards and Guidelines* (January 2001). Category A species require surveys prior to habitat-disturbing activities and special management around known sites. In the North Santiam Watershed, the potential habitat for *B. nobilissimus* is limited to the West Cascades Ecoregion.

Bridgeoporus nobilissimus is a perennial fungus species, endemic to western Oregon and Washington, and is dependent on large true fir substrates. It has been found on large old-growth stumps, snags, and trees in Oregon. The single known site of *B. nobilissimus* within the North Santiam Watershed is within a LSR on BLM land.

Noxious Weeds

Noxious weed and invasive, exotic plant infestations are very common in the North Santiam Watershed and are causing serious economic and environmental damage. These infestations devalue crops, destroy pastures, invade riparian habitats and waterways, impact human and animal health, and out compete native plant communities. The North Santiam Watershed's list of noxious weeds and invasive exotic species is representative of those occurring in other portions of the Willamette Basin and the west slopes of the Cascades.

Noxious weeds spread primarily along roads, trails, and waterways through such means that include the transfer of infested soil or gravel in road construction and maintenance activities, the movement of weed seeds and plant parts on vehicles, heavy ground disturbing equipment, and animals. Some species, such as Japanese knotweed, are effectively spread vegetatively during flood events when portions of their roots are transported downstream to new locations. Because of the fractured ownership patterns in the North Santiam Watershed, most weed

infestations are shared among neighbors. There are no established partnerships to prioritize and manage weed infestations in the North Santiam Watershed. The result of this situation is inconsistent and generally ineffective control or eradication of entire infestations. There are many situations where one land manager is treating an infestation on one side of a fence, but their neighbors are not. The result is a chronic infestation which can not be effectively eradicated or controlled.

A list of documented and potential weed species for the North Santiam Watershed is provided in Attachment C. This list was generated during an interagency meeting with representatives from Oregon Department of Agriculture, Marion Soil and Water Conservation District, Marion and Linn Counties Department of Public Works and Salem District Bureau of Land Management in the spring of 2001. A systematic inventory of the weed infestations in the North Santiam Watershed has not been completed for multiple ownerships.

Table 1 includes “A” designated weeds which either occur in small enough infestations within the state to make eradication/containment possible or they are likely to come into Oregon from neighboring states. Currently there are no known sites of category “A” species in the North Santiam Watershed.

Table 2 includes “B” designated weeds which are regionally abundant, but have limited distributions in portions of their range. Common species in this category occurring in the North Santiam Watershed include: bull thistle, Canada thistle, field bindweed, Himalayan blackberry, Scotch broom, spiny cocklebur and a few others. Some of the other “B” designated species are less common in the Willamette Valley and west slopes of the Cascades and are therefore higher priority species to control/eradicate as new sites are found in the North Santiam Watershed. These species include but aren’t limited to: diffuse, meadow and spotted knapweeds, Japanese knotweed, and yellow starthistle.

Table 3 includes “T” designated weeds which the State Weed Board has identified at target weed species on which the Department of Agriculture will implement a statewide management plan. Very few of these species are known to occur in the North Santiam Watershed. Tansy ragwort, a well established species throughout western Oregon is an exception to that rule. The cinnabar moth and ragwort flea beetle have been very effective biological control agents working on Tansy ragwort infestations throughout western Oregon. These agents have been keeping Tansy ragwort infestation densities down to economically acceptable levels in western Oregon since 1988 (*Biological Control of Weeds in the West* (1996)).

Several other harmful, invasive exotic plant species either do exist or are likely to invade habitats in the North Santiam Watershed. In areas where the soil has been disturbed and the canopy is open, such as road cuts, gravel pits, vacant lots and clear cuts, exotic species such as Reed canary grass, Oxeye daisy, teasel are common. Although these species are not classified as noxious, they compete with native vegetation and often have negative ecological and economic impacts.

Animals

As part of the analysis, the occurrence of special status/special attention wildlife species in the Lower/Middle North Santiam Watersheds was analyzed. A list of wildlife species known or suspected to occur in the Cascades Resource Area was compiled using BLM wildlife data bases, and various wildlife field guides and texts, along with knowledge of the habitats present gained through aerial photo interpretation, GIS information, and field reconnaissance. The resulting list of wildlife species was then cross referenced with *Rare, Threatened and Endangered Species of Oregon* (ONHP, February, 2001), Salem District BLM's sensitive species list, and the Regional Forester's Sensitive Species list to determine the Federal, State, BLM, and FS status of each species. Special Status species which are known or highly likely to occur in the Analysis Area and their habitat preferences is included in Attachment D. This list includes 2 federally threatened, 13 Bureau Sensitive, and 6 Forest Service Sensitive species. In addition, one Survey and Manage mollusk species, four Survey and Manage/Protection Buffer bat species, and the red tree vole have been documented or are highly likely to occur in the Analysis Area.

Little is known about the occurrence of special status invertebrate species in the Lower/Middle North Santiam Watersheds. One species, the Oregon giant earthworm, is a Bureau Sensitive species. It is associated with uncultivated soils at low elevations in the Willamette Valley. In addition, there is one Survey and Manage mollusk species that is documented to occur in the Analysis Area. The Oregon megomphix (*Megomphix hemphilli*), a Survey and Manage and Bureau Sensitive snail, is found in moist conifer/hardwood forests with bigleaf maple in association with duff and leaf litter at low to mid elevations. Surveys that have been conducted for this snail indicate that the Oregon megomphix is common along the interface between the Willamette Valley and the Western Oregon Cascades. Much of the Analysis Area is located in this transition zone between the two physiographic provinces.

The red-legged frog has been documented to occur in the North Santiam Watershed. It is a Bureau tracking and Forest Service Sensitive species which occurs in wetlands, ponds, and slow moving streams from the Willamette Valley floor to an elevation of 3,000 feet. Populations in the Willamette Valley are of greater concern than the Cascades populations. Willamette Valley populations appear to have declined due to competition with non-native bullfrogs.

The western pond turtle has been documented to occur in the recent past. It is found in marshes, ponds, lakes, slow rivers and streams, with an abundance of aquatic vegetation and emergent logs or boulders for basking. It is generally associated with Willamette Valley, but has been found as far east as the Lyons/Mehama area. The painted turtle, a Bureau Sensitive species, could also occur in the Lower North Santiam Watershed, but is more closely associated with the Willamette River than the Western pond turtle.

The harlequin duck is found on swift flowing mountain rivers and larger streams where it breeds and in rocky coastal areas during the winter. The harlequin duck is a Bureau and Forest Service Sensitive species, and has been observed on the North Santiam River. The majority of the harlequins observed in the spring are migrating upstream to their primary breeding grounds in the Upper North Santiam and its tributaries. A few harlequins have been documented as breeding in the Middle North Santiam Watershed at Fishermen's Bend and Minto Park.

The goshawk, a Bureau Sensitive species, has been observed in the Monument Peak area during the nesting season, but breeding status is unknown. Generally, the goshawk prefers late successional forests at higher elevations, such as Monument Peak, Mount Herob and Rocky Top.

The golden eagle is known to occur in the Middle North Santiam Watershed, but its breeding status is unknown. Generally an eastside species, they have been observed and confirmed to be nesting in western Oregon at a few locations. On the westside, they are associated with man made openings in early successional forest stages, following final harvest. They are known to occur in the vicinity of Monument Peak and High Rock during the nesting season. The closest known nest site is in the Thomas Creek Watershed, about three miles to the south.

The peregrine falcon, a former endangered species, is now classified as a Bureau and Forest Service Sensitive species. Nesting is not known to occur in the Analysis Area. The peregrine falcon has been documented in Little North Santiam Watershed with scattered sightings in the vicinity of Rocky Top, just north of the Middle North Santiam Watershed. The closest known nest site is seven miles east of the watershed. The peregrine falcon is highly likely to occur in the Analysis Area as a migrant and winter visitor. Suitable cliff habitat for nesting is present in the Middle North Santiam Watershed, in the vicinity of Rocky Top, Mount Herob, Monument Peak, and High Rock. Prey is available in the form of avian species such as band-tailed pigeons and passerine birds.

About half of the Analysis Area is within the Willamette Valley Physiographic Province. A number of bird species that are considered to be Willamette Valley habitat specialists are known or are suspected to occur in the Lower North Santiam Watershed. These species include the yellow-breasted Chat, grasshopper sparrow, vesper sparrow, and western meadowlark. They prefer native Willamette Valley habitats such as grasslands and riparian areas along larger streams and rivers. According to the *Conservation Strategy for Landbirds in Lowlands and Valleys of Western Oregon and Washington* (American Bird Conservancy, March 2000), BCAs have been identified in the Kingston area and the surrounding area south of Stayton, and along the North Santiam in the vicinity of Stayton Island.

The common night hawk is known to occur from the valley floor to higher elevation clearcuts. Breeding populations in the Willamette Valley are of concern. However, this species has been known to breed in the Cascades at rather high elevations in early seral and open areas.

The purple martin, Lewis' woodpecker, and the western bluebird are species native to the Willamette Valley which need cavities and standing dead/cull material for nesting. Due to the scarcity of this type of material and competition with nonnative starlings and house sparrows, these species are rare. The Lewis' woodpecker, which was formerly a summer resident, is known only as a winter visitor and transient today. The purple martin and western bluebird do utilize artificial nest boxes. The western bluebird also occurs at higher elevations in the Cascades as a breeding species.

The red tree vole, a Survey and Manage species, has been documented to occur in the Middle North Santiam Watershed. This arboreal vole is found in mid to late successional forests with closed canopies in the Western Oregon Cascades Physiographic Province. The red tree vole is considered to be a late successional associate and there is suitable habitat present in the Cascades portion of the North Santiam Watershed, primarily below 3,500 feet elevation.

The long-eared myotis, long-legged myotis, silver haired bat, and Townsend's big-eared bat are Survey and Manage/buffer species that are suspected to occur in the Analysis Area. These bats have been identified as in need of additional protection in the NFP. These bats are associated with cliff/crevice and cave habitats and some are known to utilize standing dead/cull components in forest stands. In addition, the Townsend's big-eared bat is known to use buildings and abandoned mines. They forage in a variety of habitats, especially riparian areas.

Threatened and Endangered Species

There are two federally threatened species which have been documented to occur in the Lower/Middle North Santiam Watersheds. Bald eagles have been documented to occur along the North Santiam River to Big Cliff Dam. The northern spotted owl has been documented to occur primarily in the Middle North Santiam Watershed.

Bald Eagle

There is one known bald eagle nest site in the Lower North Santiam Watershed near the confluence of the Santiam River with the Willamette River. The pair are known to utilize the Santiam and the Willamette Rivers for foraging. Bald eagles have large home ranges and are known to move long distances. Eagles have been observed in multiple locations along the North Santiam River during the nesting season. They appear to be most common in the vicinity of Big Cliff Dam, and near the confluence in the Willamette Valley. Bald eagles seen during the nesting season at Big Cliff Dam are thought to be birds nesting in the Detroit Lake area, east of the Middle Santiam Watershed. In addition, there have been a number of sightings in the vicinity of Stayton Island. To date, a nesting pair has not been confirmed in the vicinity.

There are no bald eagle concentrations or winter roosts in the Lower/Middle North Santiam Watersheds, however, they are present in small numbers as migrants and winter visitors. Wintering birds are thought to be the local birds that nest in the vicinity. A number of birds winter at Ankeny Flats, just north of the lower Santiam River and near Big Cliff Dam and Detroit Lake.

There is a limited amount of potential suitable bald eagle nesting habitat on BLM lands in the vicinity of Fishermen’s Bend in the Lower (Fox Valley) SWB. Ospreys are known to nest in the vicinity. Bald eagles have only been observed during the winter months in this location.

Northern Spotted Owl

The overall habitat conditions for northern spotted owls was analyzed across the Lower and Middle North Santiam Watersheds. Age classes and forest types were classified as suitable for nesting, foraging, dispersal and/or non-suitable habitat for the spotted owl. Non-suitable habitat was further classified as either capable or non-capable of becoming suitable habitat over time. The Willamette Valley portion of the watershed was analyzed separately and found to be non-viable for the spotted owl due to a high percentage of non-capable habitat (88%). The Willamette Valley Physiographic Province is not considered to be within the normal range of the spotted owl. Habitat acres in the Willamette Valley portion of the watershed were removed from the totals, and the remaining portion of the Analysis Area that is within the Western Oregon Cascades Physiographic Province was analyzed separately. The results are displayed in Table 1-6, Spotted Owl Habitat by Ownership in the Cascades Province of the Lower/Middle North Santiam Watersheds; and on Maps 6A/B, Spotted Owl Habitat.

Table 1-6 Spotted Owl Habitat by Ownership in the Cascades Physiographic Province of the Lower/Middle North Santiam Watersheds

Spotted Owl Habitat Class	Federal		Non-Federal		TOTAL	
	Acres	%	Acres	%	Acres	%
Suitable	2,831	37%	8,724	15%	11,555	18%
Dispersal only	2,802	36%	27,950	49%	30,752	48%
Capable	1,654	22%	11,178	20%	12,832	20%
Non-capable	362	5%	8,842	16%	9,204	14%
TOTALS	7,649	100%	56,694	100%	64,343	100%

Suitable habitat is considered to be functional for nesting and/or foraging spotted owls. Dispersal habitat includes suitable and dispersal only habitat. Approximately 18 percent of the Cascades portion of the Analysis Area is considered suitable habitat, 66 percent is functional as dispersal habitat, and 34 percent is non-suitable habitat. Of the non-suitable habitat, 59 percent is capable of becoming suitable habitat over time.

Spotted owl habitat on federal lands in the Cascades portion of the Analysis Area was further analyzed and categorized by LUA. See Table 1-7, Spotted Owl Habitat on Federal Lands in the Cascades Physiographic Province of the Lower/Middle North Santiam Watersheds by LUA.

Table 1-7 Spotted Owl Habitat on Federal Lands in the Cascades Physiographic Province of the Lower/Middle Watersheds by LUA.

Spotted Owl Habitat Class	GFMA	%	CONN	%	LSR	%	FS Matrix	%
Suitable	1,668	37%	975	38%	89	72%	99	19%
Dispersal	1,788	30%	797	31%	2	2%	214	42%
Capable	885	20%	548	22%	32	26%	190	38%
Non-Capable	136	3%	225	9%	0	0%	1	0+%
Totals	4,477	100%	2,545	100%	123	100%	504	100%

Approximately 37 percent of federal lands in the Cascades portion of the Analysis Area is considered to be suitable habitat, 73 percent is functional as dispersal habitat, and 27 percent is non-suitable habitat. Of the non-suitable habitat present on federal lands, 81 percent is capable of becoming suitable habitat over time. The amount of suitable habitat is 37 percent in GFMA, 38 percent in CONN, 72 percent in LSR, and 19 percent in FS matrix.

The Cascades portion of the Analysis Area is viable for the dispersal of spotted owls. The Analysis Area is bisected by the North Santiam River Corridor, which inhibits north/south dispersal, especially at the lower end. The Middle North Santiam Watershed provides for dispersal to/from the Upper Santiam and Little North Santiam Watersheds to the north and east, where the predominant north-south LSR/wilderness network exists and the majority of dispersal between known spotted owl sites in the Cascades Range takes place. The entire Analysis Area consists primarily of BLM and private lands, and is located outside, to the west of this major LSR/wilderness network in the Cascades Mountain Range.

To the north is the lower portion of the Little North Santiam Watershed and Silver Falls State Park. Spotted owl dispersal and occupancy is disrupted by the lack of dispersal and suitable habitat in the lower Little North Santiam. Stout SWB is important for dispersal of spotted owls to and from Silver Falls State Park, where a fairly large block of protected suitable habitat exists.

To the south of the Analysis Area is Thomas Creek Watershed and the Quartzville LSR. Connectivity between the North Santiam and the Quartzville LSR is disrupted by the lack of suitable and dispersal habitat in Thomas Creek Watershed.

The western portion of the Analysis Area, including the majority of the Lower North Santiam Watershed and immediately to the west, is the Willamette Valley floor. Spotted owl dispersal is cut off and the Willamette Valley acts as an effective barrier to movement west of the watershed.

The Analysis Area is viable for spotted owl dispersal; however, movement within the Analysis Area is inhibited by the North Santiam River Corridor. Spotted owl dispersal outside the Analysis Area is limited by the lack of dispersal habitat to the north in the Lower Little North Santiam, to the south in Thomas Creek, and to the west by the Willamette Valley. The most significant lands in the Analysis Area for spotted owl movement are the federal and state lands in the Middle North Santiam Watershed. These lands provide for dispersal of spotted owls to/from the predominant north-south LSR/wilderness network to the east, where the majority of dispersal between known spotted owl sites in the Cascades Range takes place. There is no Critical Habitat for the northern spotted owl in the Analysis Area.

Once the overall habitat conditions were analyzed across the watershed, each individual known spotted owl site (KOS) was analyzed. The KOS is established by buffering the site center with the provincial home range radius for the spotted owl. The provincial home range radius for the Western Oregon Cascades Province is 1.2 miles. Once the KOSs were established, the habitat within each was classified as either suitable, dispersal, or non-suitable habitat for the spotted owl. The results were used to estimate viability of each site. A KOS that has an intact 70 to 100-acre core area, and the equivalent of over 40 percent suitable habitat within its provincial home range radius is considered to be viable.

There are five spotted owl site centers located in the Analysis Area, all of which are located in the Middle North Santiam Watershed. Three of the five are located on BLM lands and have a 100-acre unmapped core area associated with them. The remaining two are located on non-federal lands. One of the five KOSs was found to be marginally viable, and occupancy and reproduction appear to be stable. Another site was found to be very limiting. The other three sites were found to be non-viable.

Barred owls compete directly with spotted owls for territory and prey. They are more aggressive than spotted owls and broader in their habitat requirements. The number of barred owl sightings in the Analysis Area has increased in recent years. They have been documented in every SWB in the Cascades portion of the Analysis Area, and have been confirmed as nesting in the Lower (Fox Valley) SWB.

Current acres of federal suitable, dispersal, capable habitat, and number/condition of KOSs in the Lower/Middle North Santiam Watersheds were calculated. The results are shown in Table 1-8.

Table 1-8 Current Status of the Spotted Owl and Its Habitat Within Cascades portion of the Lower/Middle North Santiam Watersheds

	Total in WAs Cascades	Total in LSR (%)	Total not in LSR (%)
Acres within Boundary	64,343	123 (<1%)	64,220 (>99%)
Total Suitable Habitat (all ownerships)	11,555	123(<1%)	11,432 (>99%)
Acres of Federal	7,649	123 (2%)	7,526 (98%)
Federal Suitable Spotted Owl Habitat	2,831	89 (3%)	2,742 (97%)
Federal Dispersal Plus Suitable Habitat	5,633	91 (2%)	5,542(98%)
Federal Capable Plus Dispersal and Suitable Habitat	7,287	123 (2%)	7,164 (98%)
Federal Critical Habitat	0	0 (0%)	0 (0%)

(% suitable habitat)	Total in WA	Total Protected (in LSR)	Total Unprotected (not in LSR)
Spotted owl sites (>40%)	1	0	1
Spotted owl sites (20-40%)	1	0	1
Spotted owl sites (<20%)	3	0	3
Total Spotted Owl Sites	5	0	5

Human Uses - Existing Conditions

What are the major past and current human uses in the North Santiam Watershed? What are the current conditions and trends of the major human uses in the watershed? Where do they generally occur in the watershed? What makes this watershed important to people?

Human use is the predominant disturbance factor in the North Santiam Watershed today. It is therefore important to have some understanding of the types and extent of human uses in the watershed. This section describes the North Santiam's general socio-economic conditions and human uses. The influence of disturbance related to human uses on the other biological resources are more fully addressed in terrestrial and aquatic sections of this document. Both the lower and the middle North Santiam Watershed are addressed together as the North Santiam Watershed, unless they differ substantially enough to warrant a separate discussion.

General Socio-Economic Environment

Before discussing specific human uses in the North Santiam Watershed, it is important to provide a general socio-economic context surrounding and including the watershed. Linn and Marion County were selected as the scale of analysis because these counties include all of the lands in the North Santiam Watershed and most of the communities within the zone of influence to those lands.

The major source of the socio-economic information provided is from the "2000 Regional 3 and Region 4 Economic Profile," prepared by the Oregon Employment Department. Region 3 includes Marion, Polk and Yamhill counties and Region 4 includes Linn, Benton, and Lincoln counties.

County Population and Demographics

Migration is expected to account for a majority of the projected increases in both Marion and Linn County, due to their proximity to the I-5 travel corridor and the relatively high quality of life they offer. The population of Marion County is projected to grow 44 percent from 230,028 residents in 1990 to 331,025 residents 2010. The population of Linn County is also projected to grow 27 percent from 91,227 residents in 1990 to 116,053 residents in 2010. Most of the increases in both counties will most likely occur near the larger cities and smaller towns in the counties, with additional growth in rural areas where county zoning allows. Salem, Stayton and Sublimity are the largest communities within and near the North Santiam Watershed. Several smaller communities include Jefferson and Mehama in Marion County, and Lyons in Linn County. Mill City and Gates are two communities which are split between Marion and Linn County, with the North Santiam River being the dividing line.

The median population age for Marion and Linn County is increasing as the “baby boomers“ of the 1950s and 1960s become older. The 1990 U.S. Census figures rank Oregon’s population as sixth nationally, for the oldest median age at 36.6 years of age. Region 3 which includes Marion County, is experiencing some of this growth, with the “age 65 +” group growing twice as fast (27.7 percent) as the region’s total population growth (12.6 percent). It is even higher for Region 4 which includes Linn County, at eight times (33.8 percent) faster than region’s total population growth (4.1 percent). In addition to the aging of existing populations, both regions are also experiencing the migration into the area by older people for retirement purposes.

Census data also indicates that ethnic diversity is increasing in Marion and Linn County. For Marion County, those residents that identified themselves as non-white grew 71 percent from 15,906 in 1980 to 27,265 in 1990. In 1990, 12 percent of Marion County’s residents identified themselves as non-white. For Linn County, those residents that identified themselves as non-white grew 33 percent from 3,087 in 1980 to 4,114 in 1990. In 1990, 4.5 percent of Linn County’s residents identified themselves as non-white. For both counties the non-white category included Blacks, Native Americans, Asian/Pacific Islanders, and Hispanics. Other non-white categories could not be compared for either county. The largest growth for both counties occurred in the Asian/Pacific Islanders and the Hispanic categories. Increases may be partially related to shifts in self-identification from white to the non-white category.

Economy

Marion County's economy and employment has historically been tied to state government, agricultural/ food processing, and lumber/wood industries, with relatively strong growth in the manufacturing of mobile homes and in high tech industries. Most of the increase in manufacturing activity in Marion County has centered around larger population centers such as Salem and Stayton.

Linn County's economy and employment has historically been dominated by agricultural, lumber/wood, and rare metals industries. The production of grass and legume seed and other agricultural products continues to be major industry in Linn County. Employment in the timber industry decreased 40 percent in both counties between 1979 and 1984. This is due in part to the reduction of timber supply on federal lands and to technological improvements in production processes. Growth in the mobile home manufacturing industry in Linn County has helped offset the timber industry decline. In 1995 Palm Harbor Homes opened a Millersburg plant, providing 300 jobs.

While the lumber/wood industry will continue to play an important economic role in the smaller communities within the North Santiam Watershed, these communities are working to diversify their economies. Participants from the thirteen communities in the North Santiam Canyon formed the North Santiam Canyon Economic Corporation to help develop and implement an overall strategic plan for their future.

Some of the common objectives include increasing the number of family wage jobs (both through existing business expansion and new business development), improving infrastructure, improving education and workforce job skills, maintaining and improving quality of life, and improving human resource services.

One of the major challenges that the canyon communities face is the on-site infrastructure needs (i.e. water and sewer) of many new businesses. With state and federal low interest loans, grants, and technical assistance, some of the communities have been working to upgrade their infrastructure and inventory lands with development potential. Business opportunities being discussed in the canyon include retrofitting old timber mills for other manufacturing activities, increasing tourism/retail businesses, value-added wood manufacturing, cottage industries, tele-commuting, and locally based special forest product co-ops.

The North Santiam River is one of the major water sources for the City of Salem. Salem has expressed concerns about the potential impacts of land uses and additional development in the North Santiam River drainage and its major tributaries, including the Little North Santiam River. This has been and will continue to be a major issue that the canyon communities, major watershed landowners and the City of Salem will need to address together.

Today, the North Santiam Watershed's major potential for contributing to Marion and Linn County's socio-economic health is tied most closely to providing wood and agricultural products, meeting water supply needs, and providing outdoor recreation and eco-tourism opportunities. The extent to which the watershed provides for each of these resources is discussed in more detail in the following sections of this analysis.

Forest Products

Federally Managed Lands

The BLM manages 11 percent (6,270 acres) of the land in the Middle North Santiam Watershed and just over one percent (1,034 acres) of the land in the Lower North Santiam Watershed (See Table 1-9). The U.S. Forest Service manages less than one percent (504 acres) in the Middle North Santiam Watershed (See Table 1-9).

Owner	Middle North Santiam Watershed		Lower North Santiam Watershed	
	Acres	Percent	Acres	Percent
BLM	6,270	11%	1,034	1%
USFS	504	< 1%	0	0%
Local Govt.	46	< 1%	0	0%
Private	0	0%	5,821	8%
Private Industrial Forest	16,745	29%	3,032	4%
Private Non-Industrial	11,109	20%	62,011	84%
State Forestry	21,929	39%	1,717	2%
State Parks	79	< 1%	30	< 1%
Total	56,619	100%	73,645	100%

Table 1-9 Summary of Ownership within the Lower and Middle North Santiam Watershed.

Timber management activities on BLM-administered lands are tied to the Land Use Allocations (LUA) specified in the Salem District Resource Management Plan (RMP, May 1995). The BLM manages 4,465 acres of under a General Forest Management LUA , 2,697 acres under a Connectivity LUA and 121 acres under a Late Successional Reserve LUA (See Land Use Allocation Maps 2A/B). BLM lands in proximity to streams also have a Riparian Reserve overlay which varies in width depending on the presence of fish (See Riparian Reserve Maps 3A/B). Based on guidance in the Salem District RMP, regeneration and thinning harvest is expected in General Forest Management Areas (GFMA) and Connectivity (CONN) LUA's. Some habitat management activities may also occur in Riparian Reserves and Late-Successional Reserves (LSR's) to meet habitat enhancement or other restoration objectives. Timber management practices on federal lands would meet or exceed the requirements of the Oregon State Forest Practices Act.

Lands administered by the U.S. Forest Service (USFS) in T. 9 S., R. 4 E., Section 15 is part of the Opal Creek Scenic Recreation Area, where timber harvest is prohibited (See Land Ownership Maps 1A/B). USFS lands in T. 10 S., R. 4 E., Section 21 are part of the Monument Peak Botanical Area, where timber harvest is prohibited unless it meets the management objectives of the area. USFS lands in T. 10 S., R. 4 E., Section 28 have General Forest Land Use allocation which allows for timber harvest activities in compliance with their forest plan.

Special Forest Products

The collection of Special Forest Products (SFP's) for personal and commercial use is allowed on most BLM-administered lands in the North Santiam Watershed in compliance with the Salem District RMP. There is no formal inventory data on the type and amount of SFP's on BLM-administered lands the North Santiam Watershed. When possible, information about SFP's are gathered during stand exams. Permits for the collection of SFP's are issued in response to requests. Based on past permits issued, moss and floral greenery are the most popular commercial SFP's collected on BLM-administered lands in the North Santiam Watershed. Some of the other SFP's collected on BLM-administered lands in the North Santiam Watershed include mushrooms, transplants, edible plants, and non-sawtimber wood products like firewood. Authorized and unauthorized collection of similar SFP's most likely occurs on private forest lands. The collection of SFP's on U.S. Forest Service would be in compliance with their SRP guidelines. Most of the collection on private and public land occurs on forest lands in the Middle North Santiam Watershed.

Industrial Timber Lands

Industrial forestry is the predominant private land use in the Middle North Santiam Watershed, but is relatively limited in the Lower North Santiam Watershed. Approximately 29 percent (16,745 acres) of the land in the North Santiam Watershed is managed by private industrial timber companies or individuals for the primary purpose of providing commercial timber products (See Table1-9 and Land Ownership Maps 1A/B).

Most private industrial forest companies seek to meet the economic objectives of their firm, while managing their lands on a sustained-yield basis. However, changes in economic factors and differences in individual company policy can significantly affect harvesting levels and practices in the short and long term. For this reason, general assumptions about the management of private industrial forest lands in the North Santiam Watershed must be made. These assumptions are based on observed past and present management practices. For the purposes of this analysis, it is assumed that unless otherwise stated, private industrial forest lands in the North Santiam Watershed will continue to be managed for commercial timber products on a sustained yield basis, with an average rotation age of 50 to 60 years.

Management practices among individual private wood lot owners also varies. Since there is such a small percentage of small woodlot owners in the North Santiam Watershed, it is assumed that these lands would be managed in a similar manner as that of private industrial forest lands. Private industrial and small woodlot owners are required to meet standards and guidelines provided in the Oregon Forest Practices Act. These assumptions would be subject to any new information gathered at a future time.

State of Oregon Administered Lands

The Oregon Department of Forestry (ODF) manages 39 percent (21,929 acres) of the land in the Middle North Santiam Watershed and two percent (1,717 acres) of the land in the Lower North Santiam Watershed (See Table 1-9). ODF lands in the Middle North Santiam Watershed are located in a fairly contiguous block in the southern portion of the watershed and are surrounded almost entirely by private industrial forest lands (See Land Ownership Maps 1A/B). ODF lands in the Lower North Santiam Watershed are more scattered along the northeast portion of the watershed, just south of Silver Creek Falls State Park (See Land Ownership Maps 1A/B).

ODF lands are managed to provide a continued source of revenue to counties and the state general fund on a sustained-yield basis. They also provide for other public uses (i.e., recreation, water and wildlife) when appropriate. For the purposes of this analysis it is assumed that state lands would be managed in a similar manner as private industrial forest lands with an average rotation age of 50 to 60 years. Management of state lands is also required to comply with the Oregon State Forest Practices Act.

Major Forest Product Related Concerns: Private landowners and public land management agencies are concerned with growing problems with illegal dumping, equipment and sign damage, vandalism, fire danger, long term occupancy, drug use/production, and the unauthorized removal of forest products. Most of these concerns are associated with forest lands in the Middle North Santiam Watershed. With the increasing regulation and restriction of forest management activities on public forest lands, private industrial forest landowners are concerned about being able to manage their lands according to their own objectives. This is a general concern in the forestry industry and extends past the boundaries of the North Santiam Watershed.

Residential and Agricultural Uses

Most of the agricultural activities occur in the Lower North Santiam Watershed. Some of the major agricultural activities include growing grass seed, christmas trees, nursery plants, and raising livestock. Most of the residents in the Lower North Santiam Watershed live in the communities of Stayton and Jefferson and along the North Santiam River and State Highway 22. Rural farms and residences are also spread throughout much of the Lower North Santiam Watershed. Most of the residents in the Middle North Santiam Watershed live in Lyons, Mehama, Mill City and Gates. Other residences are also spread out along the North Santiam River, State Highway 22.

Forest management activities on BLM-administered lands located adjacent to or near private non-forest uses, especially residential dwellings, can create potential concerns for both the BLM and residential property owners. To address these concerns early in the project planning process, the Salem District Resource Management Plan (RMP), May 1995 (page 39) identified Rural Interface Area's (RIA's) as areas with a potential for high sensitivity related to non-forest adjacent land uses (See VRM/CTZ and VRM/County Zoning Maps 7-8A/B). These RIA's include BLM-administered lands within a ½ mile of private lands zoned for 1 to 20 acre lots or larger lots with homes nearby. 1,216 acres of BLM-administered lands were identified in the Salem District RMP

as RIA's. Most of these lands are located in the foothills above the communities of Lyons and Mill City and near State Highway 22. County zoning was also used as part of this watershed analysis to identify other areas with potential sensitivity. An additional 270 acres in T. 9 S., R. 2 E., Section 31, have been identified as a potential RIA due to this parcel's proximity to Silver Falls State (See VRM/CTZ Maps 7-8A/B).

The expected intensity of forest management activities on BLM-administered lands within a RIA is guided by the underlying Land Use Allocation (LUA). RIA's with an underlying General Forest Management Area LUA would be expected to have the highest frequency and intensity of forest management activities (See Land Use Allocation Maps 3A/B). This higher intensity also increased the potential for concern by adjacent landowners. A lower frequency and intensity of forest management activities would be expected for those lands within a Connectivity or a Late-Successional Reserve LUA.

Some of the potential water quality and visual concerns associated with timber management activities may be mitigated by Riparian Reserves or green tree retention requirements. Most of the RIA's in the North Santiam Watershed have the potential for moderate to high sensitivity depending on the project type, size, and location. Consideration of RIA issues and public scoping, early in the project planning process is very important in this watershed.

Major Concerns: Most of the residential landowner concerns in RIA's are associated with timber management and recreational use. Timber management concerns are associated with potential negative impacts to water quality, scenic quality, recreational values and short term disturbance during logging operations (i.e. noise, dust, log truck traffic). Problems such as littering, vandalism, theft, trespass, fire use, shooting, and noise, and shooting associated with public use of BLM-administered lands near private property is also a concern. BLM concerns are associated with continuing to manage public lands in the watershed for forest products, public use and other objectives, while minimizing significant impacts to adjacent and nearby private landowners.

Water Uses

Water uses and concerns within and downstream from the North Santiam Watershed are described in the aquatic portion of this document.

Roads and Access

Roads also play an important role in the level and pattern of human use in a watershed. Most of the agricultural and residential lands in the North Santiam Watershed are accessed by public county roads. The forested lands in the watershed are accessed by BLM, U.S. Forest Service, state forestry and private logging roads. Most of these forest roads are narrow with a gravel surface and are not designed for public use. However, public use of these roads is occurring where roads are not gated or blocked.

Easements and Right-of-Ways

Access to BLM-administered lands in the North Santiam Watershed is complicated by the checkerboard pattern of federal, state, and private land ownership (See Land Ownership Maps 1A/B). This ownership pattern has resulted in the development of a complex system of road easements and right-of-way agreements between the BLM, state, and private landowners. The following is a summary of the most common right-of way agreements associated with roads accessing BLM-administered lands.

Exclusive Easement: Grants control of the right-of-way of a road on private land to the United States Government and allows it to authorize third party use and set rules of use.

Nonexclusive Easement: Only allows use of a road on private land by the United States, its agents, and those authorized to do business on lands administered by the United States. The underlying private landowner still controls the road, subject to the rights granted to the United States.

Reciprocal Right-of-Way: Grants the exchange of use between the United States and a private landowner. This right-of-way agreement provides for each party to use the other's roads or construct roads over the other's land.

Public Use of BLM Controlled Roads: BLM controlled roads on public or private lands are not public roads. They are considered administrative roads designed and maintained for managing public land resources. Historically the public has been allowed to use these roads to access public lands. However, the road system is not static. To offset new road construction or to reduce road densities, existing roads may be closed and decommissioned. Roads may also be left intact, but blocked or gated to reduce full sized motorized vehicle access. Some resource objectives associated with blocking or gating a road might be to reduce disturbance to wildlife or resource damage such as garbage dumping, or erosion from excessive use.

Access on U.S. Forest Service Roads: Roads accessing land administered by the U.S. Forest Service is very limited in this watershed (See Road Control Maps 4A/B). No new roads to access these lands are planned by the U.S. Forest Service.

Access on State Lands: Unless otherwise blocked, gated or signed, the use of existing roads by motorized vehicles is allowed on state lands in compliance with the rules and regulations of the State of Oregon and the Oregon Department of Forestry governing motorized vehicle use.

Access on Private Lands: Though not expressly authorized, use of private forest roads by the public to access public lands often occurs unless the road is physically blocked or gated. The gating or blocking of roads on private land is increasing, due to problems with vandalism, garbage dumping, resource damage, fire hazard and other criminal activity.

Major Concerns: Some segments of the public will continue to be concerned about maintaining public use of roads accessing public lands, while others may advocate for the closure of roads to encourage more non-motorized use. Private landowners will continue to be concerned about their access rights and the impacts of public use of their roads and lands. The BLM is concerned about providing for public access while still complying with right-of-way agreements and meeting other resource management objectives for the North Santiam Watershed and the Salem District.

Recreational Uses

A wide variety of recreational activities occur in the North Santiam Watershed. These includes developed activities associated with more urban areas and dispersed activities associated with more rural areas. The North Santiam River is a major recreational feature in the watershed. This watershed also plays an important role in meeting outdoor recreation demands of nearby larger population centers such as Salem and Portland.

Special Recreation Management Area

A Special Recreation Management Area (SRMA) is an area that has been administratively designated by the BLM as having high quality recreation opportunities and significant recreation investment on BLM-administered lands. A SRMA designation provides the BLM with a way of emphasizing both staff and other resources related to recreation management in an SRMA, but does not in any way prescribe management objectives for non-BLM lands. Fishermen's Bend Recreation Site (100 acres) is the only SRMA (Salem District RMP, page 44) in the North Santiam Watershed.

National Wild and Scenic Rivers

There are no designated National Wild and Scenic Rivers within the North Santiam Watershed. As part of the Wild and Scenic River evaluation process in the Salem District RMP, two segments of the North Santiam River were evaluated and found to be eligible for designation. Both segments are free-flowing and were found to have outstandingly remarkable values.

The upper eligible segment of the North Santiam River is 20 miles in length and extends from Big

Cliff Dam downstream to the community of Mehama. The outstandingly remarkable values identified for this segment include scenery, recreation, fish, and wildlife values. A preliminary *Scenic* classification was given to the segment.

The lower eligible segment of the North Santiam River is 38 miles in length and extends from the community of Mehama downstream to the river's confluence with the South Santiam River. The outstandingly remarkable values identified for this segment include recreational, fish, and wildlife values. A preliminary *Recreational* classification was given to the segment.

Because the BLM administers only four percent (256 acres) of the land along the North Santiam River in the upper segment and only one percent (150 acres) in the lower segment, a suitability study was not completed in the Salem District RMP. The BLM will not pursue a study or recommend designation at this time, given the ownership pattern along the river, however, will protect the outstandingly remarkable values identified for both segments until a suitability study is completed.

Recreation Opportunity Spectrum

To more clearly describe the recreational experience the North Santiam Watershed offers, the Recreation Opportunity Spectrum (ROS) planning system was used to help describe the recreation resources on private and public lands in the watershed. In classifying recreation opportunities, ROS considers access, remoteness, naturalness, facilities and site maintenance, social encounters, visitor impacts, and visitor management. There are seven major categories which progress from the most urban to the most primitive. These consist of ***Urban, Rural, Roaded Modified, Roaded Natural, Semi-primitive (motorized and non-motorized), and Primitive*** (See Attachment E). The North Santiam Watershed offers several of these settings including *urban, rural, and roaded modified*.

Urban Setting and Recreational Activities

ROS Urban Setting Characterization: *Human modifications and facility development is common to the point that it is a dominant feature. Facility development is intensified and the environment though natural appearing is often landscaped. Modifications are designed to enhance specific recreational activities.*

Those lands within an urban setting fall within the communities of Lyons, Mill City, Stayton, and Jefferson. Each of these communities have at least one city park which offers playground and picnicking opportunities. Some of the larger parks also offer group facilities, athletic fields, tennis courts, and nature trails. Schools in each community provide recreational activities such as athletic fields, tennis courts, basketball courts, and running tracks. Stayton also has an indoor community swimming pool.

Outside of the city parks, most of the land within the *Urban* setting is privately is owned. As a result, recreational activities outside city parks are primarily limited to those which can occur on public roads and walkways, such as bicycle riding, walking, and jogging.

Rural Setting and Recreational Activities

ROS Rural Setting Characterization: Characterized by an environment that is culturally modified to the point that it is dominant feature. Cultural modifications are usually associated with agricultural activities, residential activities, and utility corridors. Moderate social interaction is expected.

Outside of urban areas, most lands in the lower portion of the North Santiam Watershed fall into a *Rural* setting. Much of these lands are privately owned and the primary cultural modifications are associated with grass seed and crop fields, pasture lands, plant nurseries, and farm or residential dwellings. This *Rural* setting also extends into the Middle portion of the watershed along the North Santiam River, which has similar cultural modifications. Though the cultural modifications dominate the landscape, the pastoral setting of this part of the watershed is quite scenic.

Listed below are the developed recreation sites located within the North Santiam Watershed, which fall into a *Rural* setting. All of the developed recreation facilities are located along the North Santiam River, and all of them except John Neal Park are accessed from State Highway 22. These facilities are very popular and heavily used during the peak use season from Memorial through Labor Day weekend.

BLM Recreation Sites: Fishermen's Bend Recreation Site is located less than mile west of Mill City, and is open mid-April through October. Volunteer campground hosts and other volunteers assist park staff in the operation of this recreation site. Fees are required for overnight use and group facilities, but currently no fee is charged for picnicking or use of the boat ramp. Fishermen's Bend Recreation Site features 39 family camp units, 12 family picnic units, three group camps, three group day-use shelters, two cabins, drinking fountains, flush restrooms and showers. The park also has a small nature center with changing natural resource displays, an amphitheater that features nature programs and children's activities, nature and river access trails, a boat ramp, playgrounds, athletic fields, volleyball courts, basketball courts, and horseshoe pits. These facilities provide for a wide variety of recreational activities including camping, picnicking, boating, walking, bicycle riding, nature study, fishing, water play and the other recreational activities associated with the use of the specialized recreation facilities described above.

In 1998, Fishermen's Bend Recreation Site became part a federal Fee Demonstration Program. This program allows the fees collected at the park to be retained for use at the park for both maintenance and enhancement needs. Over the last several years, fee demonstration funds from Fishermen's Bend have been used for a variety of needs including improving accessibility at Fishermen's Bend, installing two cabins, replacing fire rings picnic tables, and to help fund volunteer staff. The BLM has recently acquired a 17-acre parcel of land adjacent to Fishermen's Bend from a willing landowner. The BLM plans to prepare a long term management plan for Fishermen's Bend and the acquired parcel.

Oregon State Parks: The Oregon State Parks Department manages two state parks in the North Santiam Watershed. Both are open year round and no fees are charged at either site. The North Santiam State Park is a day-use area located approximately four miles east of Mill City, which offers picnic sites, river access trails, a boat ramp, vault restrooms and a drinking fountain. The Maples Rest Area is located within the City of Gates and provides the only rest area between the cities of Sisters and Salem. The site offers picnic sites, flush restrooms, drinking fountains, and a short walking trail.

Marion County Parks: The Marion County Public Works Department began manages three county parks in the North Santiam Watershed. All three sites are open year round and no use fees are charged at any of the sites.

Minto Park is located just one mile east of the City of Gates and features picnic sites, walking/river access trails, and vault restrooms. Packsaddle Park is located two miles east of Gates and features facilities similar to those listed for Minto Park with the addition of a boat ramp. Niagra Park is located seven miles east of Mill City and features facilities similar to those listed for Minto Park. Niagra Park also has a historical site which features the remnants of a masonry dam that was partially constructed in the late 1890s, but abandoned in 1912. An interpretive sign on site provides information on the dam's history.

Linn County Parks: The Linn County Parks and Recreation Department manages two parks along the North Santiam River. John Neal Park is a campground located off of Lyons-Mill City Drive on the north end of 13th Street in Lyons. The site features 40 family camp units, flush restrooms, a group day-use shelter, walking/river access trails, a playground, an athletic field, and boat ramp. Fees are required for the use of campsites and the day-use shelter. The Lyons/Mehama Boat Ramp is the other park, located just under the bridge that crosses the North Santiam River between the communities of Lyons and Mehama off of State Highway 226. This boat ramp is open year round and no use fees are charged.

Outside of the developed parks, most of the land within the *Rural* setting is privately is owned. As a result, recreational activities outside the parks are limited to those which occur on public roads, bridges or along the river, such as rafting, tubing, fishing, scenic driving, bicycle riding and walking.

Roaded Modified Setting and Recreational Activities

ROS Roaded Modified Setting Characterization: Forest or other natural environment, with obvious modifications such as logging or mining activities, road access and limited facility development, within an open space context. Moderate social interaction is expected.

Much of the BLM-administered lands and other forest lands in the North Santiam Watershed fall within a **Roaded Modified** setting. Most of the on-site controls of recreational use on both private and federally-administered lands are associated with restrictive signs and gates. There are no developed recreation facilities in this setting that are open to the general public.

The main recreational activities most likely occurring in this setting, outside of developed parks include camping, hunting, target shooting, swimming, fishing, equestrian use and bicycle riding. Other uses which may occur more infrequently include berry and mushroom picking, and rock hounding. Camping is prohibited on most of the private forest land in the watershed. Several user developed trails exist on private, state and BLM-administered lands above Mill City and in the Shellburg Creek/Falls area south of Silver Falls State Park. The trail segments on BLM-administered lands have not been mapped. The trails appear to receive primarily non-motorized use, however off-highway vehicle use also occurs in the general area, especially in the area above Mill City. The Oregon Department of Forestry also manages a large block of land in the Rock Creek area (See Land Ownership Maps 1A/B) All of these areas offer potential for cooperative trail management and other recreational partnerships between the state, BLM, private landowners, and user groups.

U.S. Forest Service Administered lands

The U.S. Forest Service (USFS) has very limited ownership in the North Santiam Watershed and most of the lands they manage fall within a *Roaded Natural* setting (See Attachment E). This includes part of the Monument Peak Special Interest Area (T. 10 S., R. 4 E., Section 21). There may be opportunities for trail development and interpretation in the Monument Peak Special Interest Area, however there is no management plan for this area. The lands in T. 9 S., R. 4 E., Section 15 fall within the Opal Creek Scenic Recreation area and have a *semi-primitive, non-motorized* setting (See Attachment E). There are no developed recreation facilities in either setting and site controls are very limited in these areas.

Off Highway Vehicle Use and Designations

An off-road vehicle (ORV) is defined by the BLM in the Code of Federal Regulations (Subpart 8340.0-5) as, “Any motorized vehicle capable of, or designed for, travel on or immediately over land, water, or other natural terrain, excluding: (1) Any non-amphibious registered motorboat; (2) any military, fire, emergency, or law enforcement vehicle, while being used for emergency purposes; (3) any vehicle whose use is expressly authorized by the authorized officer, or otherwise officially approved; 4) vehicles in official use; and (5) any combat or combat support vehicle when used in times of national defense emergencies.”

The BLM more commonly refers to off-road vehicles as off-highway vehicles, a term that is more frequently used in private industry and more accurately reflects the use of existing roads by a variety of motorized vehicles. Unless quoting BLM regulations, the term off-highway vehicle (OHV) will be used in this analysis. Though BLM-administered roads are not public roads, motorized vehicle use of both the BLM and private forest roads does occur. This use is an important resource to many people in accessing public lands. The Salem District Resource Management Plan provides a designation system that sets guidelines for the use of OHV’s on BLM-administered lands in the Salem District.

The mapping and updating of OHV designations for the Cascades Resource Area including the North Santiam Watershed, were recently completed in 1999. The following is a summary of the designations for OHV use in the North Santiam Watershed.

Limited to Existing Roads and Designated Trails (ERDT): Approximately 7,131 acres of BLM-administered lands with a General Forest Management or Connectivity Land Use Allocation (LUA) are designated as ERDT (See Land Use Allocation Maps 2A/B). This also includes the Riparian Reserves around all streams. This designation limits motorized use to existing rock surfaced roads, while still providing an opportunity for the designation of off-road trails. This designation does not authorize the use of privately controlled roads.

OHV Designation	Acres
Limited to Existing Roads and Designated Trails	7,131
Limited to Designated Roads	121
Closed	31
Total	7,283

Table 1-10 OHV Designations in the North Santiam Watershed.

Currently no off-road trails have been designated as open to OHV use. Much of the BLM-

administered lands in this designation are intermixed with private industrial forest lands. Generally, private landowners discourage off-road use by motorized vehicles, however use of existing roads does occur if not actively restricted by the landowner. This land ownership pattern makes it very difficult for the BLM to provide off-road opportunities, without contributing to trespass and resource damage on adjacent private lands.

There is also growing concern about the resource impacts of off-road use on BLM-administered lands such as erosion into streams with threatened fish species, damage to vegetation, and disturbance to wildlife. These impacts could be somewhat mitigated in a managed trail system, however, without participation of adjacent private landowners, such a system will most likely not be feasible. Groups or individual users may still propose existing or new trails for designation, however, obtaining adjacent landowner support and addressing resource damage concerns will be important factors in the approval process. The only area where there is a significant block of public land is the Rock Creek area, the majority of which is managed by the Oregon Department of Forestry (See Land Ownership Maps 1A/B).

Limited to Designated Roads (DR): Only 121 acres of BLM-administered lands with a late-successional LUA are designated as DR (See Land Use Allocation Maps 1A/B). Again, this designation does not authorize the use of privately controlled roads. The DR designation is related to similar resource concerns listed for ERDT, with special emphasis associated with reducing disturbance to wildlife. Off-road use by motorized vehicles is not generally compatible with Late-Successional Reserve management objectives, so no existing or new trails would be designated for OHV use. The DR designation has not yet been fully implemented, so use of a majority of the existing roads is still occurring. Even with maps and signs, past observations indicate that the use of roads not designated as open is likely to continue until the road is gated or blocked. To be successful, this DR designation will require more aggressive road management and decommissioning efforts.

Closed: The North Santiam (31 acres) Area of Critical Environmental Concern is the only area on BLM-administered lands closed to OHV use in the North Santiam Watershed. There is no road access to this area, and there are no currently problems with off-road use.

U.S. Forest Service Lands: OHV use on lands administered by the U.S. Forest Service are limited (504 acres) limited to the use of existing roads.

Other Non-federal Lands: Motorized vehicle use of state lands in the watershed are currently limited to existing gravel roads, but the potential for providing managed off-road use may be explored in the future (See Recreation Uses Page 34). Motorized vehicle use of private lands is also generally limited to existing gravel roads (unless otherwise signed), however no specific information from landowners in this watershed was no obtained.

Visitor Use Estimates and Recreation Demands

There is very limited quantitative field-based recreation visitation data available for the North Santiam Watershed. Limited field observation indicates that dispersed visitation to this watershed is low to moderate, with the peak-use season being in the late June through early September. Visitation to developed sites is moderate to high during the same peak-use season. More field-based use data is needed for estimating accurate visitation.

The North Santiam Watershed falls within Region 8 of the Statewide Comprehensive Outdoor

Recreation Plan, 1994-1999 (SCORP). Region 8 includes Yamhill, Polk, Benton, Marion, Linn and most of Lane County. SCORP analyzed the supply and demand relationship between ROS settings and recreational activities. While the same activity can occur in several different ROS settings, an individual's experience is expected to vary by setting. The SCORP report compared categories of "Used" for settings actually used for an activity by a user, versus a "Preferred" for settings preferred for that activity by the same user. Those activities that show a higher demand in "Preferred" than "Used" suggests that there may be an inadequate supply of that setting for a particular activity. The SCORP data indicates that there is a shortage of both *primitive* and *semi-primitive* settings for most of the recreational activities in Region 8 and that the "Used" category outweighs the "Preferred" category for most recreation activities occurring in *rural* and *roaded natural* settings. This is true for most of the other regions in western Oregon.

The ROS settings in the North Santiam Watershed reflect the SCORP findings, with the majority of both public and private lands falling into the *urban*, *rural* and *roaded modified* ROS settings. Given the land ownership and use pattern, it is unlikely that this watershed could provide additional *semi-primitive* or *primitive* settings.

Major Concerns: For developed sites, traditional funding for recreation facilities maintenance is declining at the federal, state, and local levels. This will make looking for partnership opportunities and alternative funding sources very important in the future.

Those groups or individuals that participate and support motorized off-road use will continue to be concerned about having areas to use. At the same time, other user groups or individuals may support greater restrictions on off-road motorized use in favor of nonmotorized activities. Private landowners will continue to be concerned about their access rights and the impacts of public use on their roads and lands. The BLM is concerned about providing both motorized and non-motorized opportunities in a variety of ROS settings, while still meeting other resource management objectives for the North Santiam Watershed and the Salem District as a whole. Internal mapping of the OHV designations has been completed, however, maps for public use, brochures, and signs still need to be developed. Staff time and funding for this program has historically been very limited. More support is needed if the program is to be adequately managed.

Visual Resources

Though not a direct human use, visual resources is important to those living in or visiting the North Santiam Watershed. Much of the viewshed in the North Santiam Watershed has been modified by human occupation.

The middle portion of the viewshed in the North Santiam Watershed is dominated by forest lands, however residential, agricultural and livestock raising activities are readily evident along the State Highway 22 and North Santiam River Corridor. Visual modifications in this portion of the watershed are associated with roads, utilities, and timber harvest activities on primarily BLM-administered and private lands. The lines created with the removal of trees for roads, utilities and timber harvest units on both private and public lands often contrast with lines, color and texture of adjacent forested areas.

The lower portion of the viewshed in the North Santiam Watershed is almost entirely modified with agricultural and residential activities. While these lands can still considered to be quite scenic, very little of the native vegetation and character remains.

In an effort to address visual resources on BLM-administered lands, a Visual Resource Management (VRM) classification system was developed and used to inventory all BLM-administered lands in the Salem District (Salem District RMP, page 36-37).

There are four classes of scenic values within the VRM system. The classes range from Class I lands having the highest scenic values and receiving the greatest protection down to Class IV lands having the lowest scenic values and fewer modification restrictions.

Below is a summary of BLM-administered land within each VRM Class for the North Santiam Watershed.

Class I Lands

“Provide for natural ecological changes in visual resource management Class I areas. Some very limited management activities may occur in these areas. The level of change to the characteristic landscape should be very low and will not attract attention. Changes should repeat the basic elements of form, line, color, texture, and scale found in the predominant natural features of the characteristic landscape (Salem RMP, page 37).”

Class I	Class II	Class III	Class IV
16 acres	444 acres	5,741 acres	1,085 acres

Table 1-11 VRM Classifications in the North Santiam Watershed.

Less than one percent (16 acres) of BLM-administered lands in the North Santiam Watershed have a VRM Class I status (See VRM/CTZ Maps 7-8A/B). The area classified as VRM I is a waterfall located near Silver Falls State Park. The waterfall is located within Riparian Reserves, which should provide an adequate buffer from any adjacent timber management activities. There is no developed access to any of the waterfalls. In general, any development associated with recreational use should be kept to a minimum for resource protection and public safety. Potential design and mitigation features would need to be developed on a site specific basis for any project that might potentially impact visual resources.

Class II Lands

“Manage visual resource management Class II lands for low levels of change to the characteristic landscape. Management activities may be seen but should not attract the attention of the casual observer. Changes should repeat the basic elements of form, line, color, texture, and scale found in the predominant natural features of the characteristic landscape (Salem RMP, page 37).”

Approximately six percent (444 acres) of BLM-administered lands in the North Santiam Watershed have a VRM Class II status. Most of the Class II lands are located within Fishermen’s Bend Recreation Site in T. 9 S., R. 2 E., Sections 25 and 26. Other smaller areas are located in T. 9. S., R. 2 E., Section 23 and T. 9 S., R. 3 E., Section 29, were given a Class II status due to their proximity to State Highway 22. While Fishermen’s Bend has been substantially modified by recreational facilities, visual resources should still be considered in any future developments in the park. For Class II lands outside of Fishermen’s Bend, design features such as increased green tree retention or buffers may help mitigate the impacts to visual resources associated with timber harvest activities. Site specific impacts and mitigating actions for visual resources will need to be evaluated for each project. Some of the Class II lands are also located within RIA’s (See VRM CTZ/ Maps 7-8A/B). These lands may have greater sensitivity, and design features should incorporate both visual and interface concerns.

Class III Lands

“Manage visual resource management Class III lands for moderate levels of change to the characteristic landscape. Management activities may attract attention, but should not dominate the view of the casual observer. Changes should repeat the basic elements of form, line, color, texture, and scale found in the predominant natural features of the characteristic landscape.”

Approximately 79 percent (5,741 acres) of the BLM-administered lands in the North Santiam Watershed have a VRM Class III status (See VRM CTZ/ Maps 7-8A/B). The majority of BLM-administered lands in the North Santiam Watershed were given a Class III rating due to their proximity to and visibility from residences along Lyons-Mill City Drive and State Highway 22.

These Class III lands are also intermixed with private industrial forest lands where timber management activities are often observable. A proposed project's impacts to visual resources on Class III lands will vary depending on the specific project design features and a number of mitigating factors such as the presence and location of riparian reserves, roadside vegetation buffers and vegetation buffers around residences. Class III lands that are also within Rural Interface Areas (See Rural Interface and VRM Maps 7-8A/B) may have greater sensitivity, and design features should incorporate both visual and interface concerns.

Class IV Lands

“Manage visual resource management Class IV lands for moderate levels of change to the characteristic landscape. Management activities may dominate the view and be the major focus of viewer attention. However, every attempt should be made to minimize the effect of these activities through careful location, minimal disturbance, and repeating the basic elements of form, line, color, and texture (Salem RMP, page 37).”

Approximately 15 percent (1,085 acres) of BLM-administered lands in the North Santiam Watershed have a VRM Class IV status (See Rural Interface and VRM Maps 7-8A/B). Class IV lands generally have a low visual sensitivity and fall into the “seldom seen” category. In this watershed, Class IV lands are often adjacent to private industrial forest lands where forest management activities are often observable. While sensitivity on Class IV lands is generally low, the impacts of proposed projects to visual resources should still be evaluated and mitigation measures considered.

U.S. Forest Service Lands

Lands administered by the U.S. Forest Service in T. 10 S., R. 4 E., Section 28 are managed by maximum modification visual quality objectives that allow some changes to the viewshed. Lands in T. 10 S., R. 4 E., Section 21 are managed by objectives associated with the Monument Peak Special Interest Area, which requires retention of scenic values and visual quality. Visual quality would be retained on lands in T. 9 S., R. 4 E., Section 15, in the Opal Creek Scenic Recreation Area.

Lands and Minerals

Interest in the commercial extraction of mineral resources and energy resources on BLM-administered lands in the North Santiam Watershed is currently low and is not expected to increase significantly in the near future. The primary mining activities on BLM-administered lands in the North Santiam Watershed are associated with rock quarries for road building. Other uses are associated with right-of-way agreements for roads, utilities and communication sites. There are no known gas leases on BLM-administered in the North Santiam Watershed.

Prohibited Uses

Prohibited uses on public and private lands generally involve illegal dumping, vehicle abandonment, long term occupancy, equipment and sign vandalism, wildlife poaching, unauthorized removal of forest products, and growing or manufacturing illegal drugs. Funding for either local, state or federal law enforcement in this area is currently very limited. Some interagency coordination between private, local, state, federal landowners and law enforcement agencies already occurs, but more work is needed.

