

Future Trends

Terrestrial

Management Objectives and Direction

This chapter projects future trends of vegetation and ecological processes functioning in the watershed on various land ownerships under applicable forest plans, federal and state laws. The applicable forest planning documents include the *Northwest Forest Plan* (NFP), *Salem District (BLM) Resource Management Plan* (RMP), the *Final Environmental Impact Statement for the Willamette National Forest Land and Resource Management Plan*, and the *Northwest Oregon State Forests Management Plan*. For the purposes of this analysis, the Analysis Area is defined by the Lower and Middle North Santiam watersheds. Lands within the Analysis Area are managed by many landowners under a variety of management objectives.

Oregon Department of Forestry Lands

The Oregon Department of Forestry (ODF) manages 18 percent (23,639 acres) of the Analysis Area as part of the Santiam State Forest. ODF is a major land manager in the Middle North Santiam, where 39 percent of the watershed is managed by ODF. The latest draft of *Northwest Oregon State Forests Management Plan* was issued January, 2001. The *Clackamas-Marion District draft Implementation Plan* (May, 2001) describes forest management for all forest resources on the Clackamas-Marion District, including the state lands in the North Santiam Watershed, which are located in Marion and Linn counties. These documents describe a Structure Based Management Plan, based on current conditions and desired future landscape design. Individual forest stands were classified by Forest Stand Types, which roughly correspond to successional stages. Current percentages of each Forest Stand Type were calculated and desired future conditions were determined based on a variety of management considerations.

The Santiam State Forest is divided into seven Management Basins, established using major drainages and state ownership patterns. Portions of four Management Basins occur in the Analysis Area, mostly in the Middle North Santiam Watershed. The Green Basin, contains 15 percent of the Santiam State Forest's land base. It is located in the eastern portion of the Middle North Santiam Watershed, northeast of the city of Gates. The Mad Creek Basin contains 14 percent of the Santiam State Forest, and is located southeast of Gates. The Rock Creek Basin is the largest contiguous block of state land, encompassing 27 percent of the Santiam State Forest, located southeast of Mill City. The Scattered Basin consists of 15 scattered parcels of state lands located throughout Clackamas, Marion, and Linn counties. In the North Santiam, parcels of the Scattered Basin are located in the Stout sub-watershed basin (SWB) of the Lower North Santiam Watershed, and north of Mill City in the Middle North Santiam Watershed.

Over 50 percent of the state lands in the Analysis Area are in mid-successional stages in the

closed single canopy condition. According to the Implementation Plan, the primary goal is create a larger percentage of older forest structure and layered stands than exist currently. Interior Habitat Areas (IHAs) of various sizes consisting of older forest structure and layered stands would be established in specific areas to protect municipal watersheds, sensitive fisheries, recreation and scenic areas, and provide spotted owl habitat. IHAs are planned in the Rocky Top area of the Green Basin, in the Mad Creek and the Rock Creek Basins to provide habitat for spotted owls, and in recreation and scenic areas in the Scattered and Green basins. The desired future condition of state lands in the watershed would be to reduce the amount of acreage in closed single canopy conditions through thinning and density management treatments. The amount of older forest structure and layered stands would increase from less than 10 percent to the desired future condition of over 50 percent in the long term. Refer to the *Clackamas-Marion District draft Implementation Plan* (May, 2001) for more details.

Private Lands

There are a large number of private landowners in the Analysis Area with varying land management strategies and objectives. During the analysis, private lands were classified as either non-industrial or industrial private lands. Non-industrial private lands are owned by smaller private landowners and include the majority of the urban/rural residential, agricultural and non-forest types, especially in the Willamette Valley. Non-industrial private lands comprise 60 percent of the Analysis Area. The industrial private lands are managed by commercial forest landowners, companies or corporations primarily for timber management. Industrial private lands comprise 15 percent of the Analysis Area. These lands are managed in compliance with the Oregon Forest Practices Act (OFPA), primarily on economic rotation lengths of 40 to 70 years.

Federal Lands

There are 7,808 acres of federal lands in the Analysis Area. Ninety-four percent of the federal lands are managed by the Salem District BLM (7,304 acres). The remaining six percent (504 acres) are managed by the Willamette National Forest, Detroit Ranger District. Federal lands are managed according to the standards and guidelines of the Northwest Forest Plan (NFP). See Maps 3A/B Land Use Allocations, and Maps 1A/B, Ownership. There are several BLM Land Use Allocations (LUAs) within the Analysis Area. The majority of BLM lands (4,477 acres) occur in the General Forest Management Area (GFMA) LUA. These lands are to be managed on rotation lengths defined by culmination of mean annual increment, which generally is 70 to 100 years. Green tree retention is lower than that required for the Connectivity (CONN) LUA. All of the Forest Service (FS) lands in the Analysis Area are matrix lands, managed much like GFMA.

Contained within the Analysis Area are portions of CONN blocks (2,704 acres) identified during the planning process. According to the Salem District RMP, these lands are to be managed on a 150- year rotation with greater green tree retention than GFMA. These CONN blocks are also designed to maintain 25 to 30 percent older forest (late successional) conditions through time.

There are 123 acres of Late-Successional Reserves (LSR) in the Analysis Area. In addition, there are three unmapped core areas around spotted owl sites in the matrix that are managed much like LSRs. Each core area is approximately 100 acres in size. According to the NFP, LSRs are to be managed to maintain and enhance late successional conditions over time.

Overlaying the entire federal land base are Riparian Reserves. See Maps 3A/B, Federal Land Use Allocations with Riparian Reserves. They have been identified as buffers along all standing and flowing water, intermittent stream channels, ephemeral ponds, and wetlands. Riparian reserves are to be managed to maintain and enhance riparian and late successional conditions to meet Aquatic Conservation Strategy Objectives. The reserves were designated to help maintain and restore riparian structures and functions, benefit fish and riparian-dependent non-fish species, enhance habitat conservation for organisms dependent on the transition zone between uplands and riparian areas, improve travel and dispersal corridors for terrestrial animals and plants, and provide greater connectivity of late successional forest habitats. The width of the protection buffer varies depending on stream class and the height of site potential trees. All fish-bearing streams have a minimum width that is the average height of two site potential trees. On non-fish bearing streams, this width is the average height of one site potential tree. Since not all these streams are mapped, some adjustments will be made as site-specific areas are mapped. For this watershed analysis, site tree height was designated as 220 feet for the lands less than 1,500 foot elevations, 200 feet for elevations between 1,500 and 3,000 feet, and 180 feet for elevations above 3,000 feet. Stream densities in the Analysis Area are fairly high and it is estimated that 49 percent of the federal land base is within Riparian Reserves. Refer to the NFP and Salem District RMP for more details regarding standards and guidelines, and best management practices for the various land use allocations.

Vegetation Patterns

The current conditions of the terrestrial domain are the result of altered processes. The current (altered) conditions in combination with the human processes that now dominate the ecosystem within the Lower/Middle North Santiam Watersheds are expected to continue. Wildfire exclusion and resource extraction will continue to be the dominant forces influencing future conditions. However, natural processes (erosion, mass wasting, disease, insect infestations, and storm-related events) will continue to affect the terrestrial domain across the watershed.

The current proportion of forest/non-forest types is expected to remain approximately the same at 47 percent forest, and 53 percent non-forest types. The non-forest types in the urban/rural residential/agricultural areas may increase slightly over present conditions as urbanization continues its eastward expansion along the North Santiam River Corridor into the Middle North Santiam Watershed. Declines in hardwood/mixed forest types at lower elevations of the Analysis Area could continue as a result.

Seral Stages

Late successional habitat on non-federal lands is expected to stabilize at levels of about five percent of the Analysis Area, then increase approaching 10 percent over time. State lands in the Santiam State Forest, OFPA riparian buffers and resource protection sites on private lands are expected to contribute to late successional habitat in the future. Assuming an average rotation of 60 years on private lands with even flow of harvestable acres over time, approximately a third of the forest types on private lands would be distributed between each of the 20- year age classes (0 to 20; 20 to 40; and 40 to 60 years of age). Over half of the state lands in the Analysis Area would be in older forest structure and layered stands in the long term.

According to the NFP, a minimum of 15 percent of the federal lands in any given watershed should be in late successional conditions over time. Currently, about 36 percent of the federal land in the Analysis Area is in late successional habitat. The amount of late successional habitat on federal lands is expected to increase under the NFP. The distribution of late successional habitat would follow Riparian Reserves on matrix lands, and would include LSRs and the 25 percent late successional habitat in Connectivity blocks. As Riparian Reserves are allowed to mature over time, about 45 percent of the federal lands in the watershed have the potential to become late successional habitat in the long term under current management. The 15 percent late successional retention guideline and the 25 to 30 percent older forest retention in CONN would be represented entirely within LSRs and Riparian Reserves.

Currently, nine percent of the Analysis Area (all ownerships) is in late successional habitat. In the long term, as Riparian Reserves on federal lands, older forest structure and layered stands on state lands, and OFPA buffers on non-federal lands mature, the entire Analysis Area has the potential to support 13 to 15 percent late successional habitat under current management. There would be an increase in the amount of late successional habitat across the watershed, primarily due to the restoration of state and federal lands into late successional, older forest structure and layered stands over time.

There is a large difference in the amount and distribution of late successional forest between the Lower and the Middle North Santiam watersheds. In the Lower North Santiam, 3 percent is currently in late successional forest, whereas in the Middle North Santiam, 17 percent is late successional. This divergence between the two watersheds is expected to become more pronounced as state and federal forested lands in the Middle North Santiam mature. The amount of state and federal lands in the Lower North Santiam is less than four percent, which is not enough to contribute significantly to the amount of late successional habitat in the watershed over time. In the long term, the Lower North Santiam is likely remain at 3 percent or less late successional, whereas the amount of late successional in the Middle North Santiam could approach 25 percent under the standards and guidelines of the NFP and the *Northwest Oregon State Forest Management Plan*.

Standing Dead/Down Logs

The number of standing dead trees (snags) is expected to decline in the short term as material in more advanced stages of decay fall down and decompose. Over the long term, the amount of standing dead on federal lands is expected to approach 60 percent of potential cavity dwelling wildlife populations as late successional habitat is restored in riparian reserves and green tree retention guidelines are implemented. On non-federal lands, OFPA requirements for standing dead and stream buffers would help contribute to the standing dead resource across the Analysis Area.

Down CWD is expected to decline in the short term as material in more advanced stages of decay continues to decompose. Over the long term, down CWD on federal lands is expected to increase as riparian reserves develop into late successional and green tree retention guidelines are implemented. The OFPA requirements for down logs and buffers would help contribute to down CWD on non-federal lands in the future.

Roads and Transportation

Road densities are expected to increase slightly within the Analysis Area as additional roads are constructed for timber harvest on non-federal lands. Average total road density on federal lands is estimated at about five miles per section, which is high. Management direction for federal lands within the Analysis Area calls for no net increase in roaded miles. This means that when a road is built, it will either be removed (decommissioned) upon completion of timber harvest activities or a like amount of road will be decommissioned elsewhere in the Analysis Area. This trend is expected to continue, with no net increase and likely a net decrease in road densities on federal lands in the future.

There is a high percentage of roads which are at least seasonally closed which helps reduce disturbance to wildlife, particularly on non-federal lands. This trend is anticipated to continue as private land owners maintain current closures and close additional areas, and federal roads are decommissioned or closed to meet the Aquatic Conservation Strategy Objectives.

Special Status/Special Attention Species

Plants

Almost all of the Special Status species known to occur in the North Santiam Watershed inhabit prairie remnants along roadsides and are influenced by succession, mowing, herbicides, plowing, and numerous other land management activities which are more widespread and frequent in the lower elevations. These Willamette Valley species include: *Aster curtus* Cronquist, *Delphinium oreganum* Howell, *Erigeron decumbens* Nutt. Var. *decumbens*, *Lathyrus holochlorus* (Piper) C.L. Hitchc., *Lomatium bradshawii* (Rose) Mathias & Constance, *Mimulus tricolor* Hartw., and *Sidalcea nelsoniana* Piper. Most of the native Willamette Valley habitats have been converted to agricultural/rural uses. Less than one percent of the original valley bottom prairie habitat, where these species probably resided, remain intact. Invasive plant species have become established in the ecosystem and are expected to continue to compete with native vegetation, including rare plant populations. Habitat conditions for Special Status plant species known or suspected to occur in the Willamette Valley ecoregion of the North Santiam Watershed are expected to degrade over time.

The single known site for *Lomatium bradshawii* within the North Santiam Watershed is actively being managed for the species recovery at the Kinston Prairie Preserve. Habitat conditions for *L. bradshawii* and other associated rare plant species are expected to remain stable or improve over time at this particular location. Over the past several years, more land has been acquired by the TNC in this area and management activities targeted at managing high quality meadow habitat have included Scotch broom and Himalayan blackberry removal, along with other management activities to prevent the encroachment of trees and shrubs into the open prairie habitat.

Cimicifuga elata (tall bugbane) occupies roadsides and moist forests at low to mid-elevations in the North Santiam Watershed and in the surrounding watersheds. Though there are few known sites of this species in the North Santiam Watershed, ample potential habitat appears available for the species. Roadside habitats are at risk of becoming degraded from invasive plant encroachment, mowing, and herbicide application. Over the long term, conditions for potential *Cimicifuga elata* habitat are expected to remain stable.

Bridgeoporus nobilissimus is closely associated with old-growth forests with large noble fir stumps, snags and trees. There is very limited potential habitat available for this species in the North Santiam Watershed. Even though this site is protected and managed in a LSR, the future of this population is uncertain as the life history requirements of *B. nobilissimus* are not well understood. The single observed conk in this population exists on an old stump in a thirty-five year old plantation. This stump will continue to decay and will eventually not be able to support the *B. nobilissimus* any longer. It is not known if *B. nobilissimus* is currently associated with any other host substrates or if it will be able to effectively inoculate the younger noble fir at the site. The best science available suggests that the potential future habitat for *B. nobilissimus* will improve in the Monument Peak area, when the noble fir trees reach maturity.

Noxious Weeds

Weed coordination at the local level is essential for successful infestation control and eradication. Where county weed programs do exist, they provide assistance to private land owners to implement weed control projects and enforce state weed laws (*Oregon Noxious Weed Strategic Plan: Comprehensive guide for the protection of Oregon's resources* (January 2001)). Currently, neither Linn nor Marion counties have weed boards or supervisors.

An effort is underway to initiate a Willamette Basin Invasive Weed Management Partnership which would be open to participation for land managers and owners in the North Santiam Watershed. The partnership's goals are to:

1. Prevent the introduction and control the spread of the most harmful invasive plant species in the Willamette Basin by facilitating cooperative management among all land managers.
2. Unite the individual ownership's and jurisdictions that make-up the Willamette Basin, enabling them to work toward a common interest for the management of invasive weeds.

If this partnership is successful, it will promote the development and funding of local weed boards, including Linn and Marion counties and programs. Until weed management partnerships are formed and land managers implement coordinated weed control and management, efforts to restore native plant communities, water quality, fish and wildlife habitat, recreational sites, forests, and farmlands will continue to be negated by increasing and more varied weed infestations.

Animals

Habitat conditions for late successional species of concern are expected to improve in the long term as Riparian Reserves and state lands develop older forest structure over time. Habitats for priority species that use snags and/or down logs are expected to decrease in the short term and increase in the long term with increased retention requirements on both federal and non-federal lands.

Threatened and Endangered Species

Bald Eagle

Habitat conditions for the bald eagle are expected to improve slightly over time as riparian areas along larger streams develop, providing more trees suitable for nesting and perching. However, the majority of the improvement in older forest conditions in the Analysis Area will be in upland areas and riparian reserves along smaller streams, where there would be negligible benefit to bald eagles.

Northern Spotted Owl

Suitable habitat for the northern spotted owl is expected to follow similar trends as described previously for late successional habitat. Overall, habitat condition for the spotted owl is expected to improve in the long term.

The Analysis Area will continue to be viable for spotted owl dispersal. However, movement within the Analysis Area will continue to be 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 the Willamette Valley to the west. The most significant lands in the Analysis Area for spotted owl movement are the federal and state lands in the Middle North Santiam Watershed, which 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. The state lands in the Rock Creek and Mad Creek basins will be managed more for the development of older forest structure and layered stands than other state lands in the Analysis Area, so late successional conditions should improve over time. The distribution of suitable and dispersal habitat will follow Riparian Reserves on federal lands and will include the LSRs and the 25 percent late successional habitat in the CONN blocks.

Of the five known spotted owl sites (KOSs) with site centers in the Analysis Area, one 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 were found to be non-viable. In the long term, viability could improve in the vicinity of these KOSs, due to the development of older forest structure and layered stands on state lands in the Rock Creek and Mad Creek basins. Two of the five KOSs would be viable, two would be limiting, and one would remain non-viable

over time.

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. The number of barred owl sightings in the Analysis Area are expected to continue to increase as nesting pairs produce young. In the future, barred owls will likely be confirmed as nesting in other SWBs.

Potential future conditions of the spotted owl and its habitat in the Analysis Area was estimated and the results are shown in Table 2-1.

Table 2-1 Future 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 (%)
Acreage within Boundary	64,343	123 (<1%)	64,220 (>99%)
Total Suitable Habitat (all ownerships)	17,382	123(<1%)	17,259 (>99%)
Acreage of Federal	7,649	123 (2%)	7,526 (98%)
Federal Suitable Spotted Owl Habitat	3,600	123 (3%)	3,477 (97%)
Federal Dispersal Plus Suitable Habitat	5,280	123 (2%)	5,157(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%)	2	0	2
Spotted owl sites (20-40%)	2	0	2
Spotted owl sites (<20%)	1	0	1
Total Spotted Owl Sites	5	0	5

Human Uses - Trends

Socio-Economic

The major socio-economic contributions that public lands in the North Santiam Watershed will most likely continue to provide will be related to the timber and agricultural industry, meeting water supply needs, and providing outdoor recreation and eco-tourism opportunities. Both counties will most likely continue to see relatively rapid population growth as a result of migration into the counties. With Marion and Linn county's proximity to I-5, both counties offer a prime location for future business development. This is beginning to pay off even now, as firms and businesses look further south of the Portland area into the Willamette Valley for relocation and expansion. Though the smaller rural areas may not see as rapid rate of growth, some increases in population and economic development would be expected. In addition, growth in neighboring urban areas would also provide employment opportunities for those willing to commute from the canyon communities.

Forest Products

It is expected that demand for wood products will most likely remain fairly high, unless a desirable and cost effective substitute becomes available. Some of this demand will be met through the importation of wood products, however, domestic wood products will also be an important component of supply.

Private Industrial Timber Lands and State of Oregon Administered Lands

A general rotation age of 50 to 60 years is expected to continue; however, harvesting levels and practices may vary depending on individual company policy, as well as economic and regulatory factors. Similar trends are expected for small wood lot lands and lands managed by the state of Oregon. Ongoing demand and county zoning guidelines, makes it likely that industrial forestry will continue to be the predominant land use of private lands in the middle portion of the North Santiam Watershed.

Federally-administered Lands

Wood products will continue to be provided from BLM-administered lands consistent with the Salem District RMP. The majority of commercial wood products will come from BLM-administered lands with a General Forest Management or a Connectivity Land Use Allocation. Very little commercial wood products are expected from management activities on lands with a Late-successional Reserve or Riparian Reserve Land Use Allocation (See Land Use Allocation Maps 3A/B).

Timber management activities lands administered by the U.S. Forest in compliance with their Willamette National Forest Plan. Wood projects from these lands administered by the U.S. Forest Service is expected to be limited due to the small acreage (504 acres) they manage in the North Santiam Watershed and the harvest restrictions placed on most of that acreage.

Special Forest Products

Demand for special forest products has potential for growth. Until more agency resources are available for inventory and program administration work, meeting increases in demand may be difficult.

Residential and Agricultural Uses

Management activities on BLM-administered lands adjacent to residential or non-forest private lands will continue to be a concern. If the current zoning guidelines remain in place, the conversion of industrial forest lands to residential uses would be relatively slow and concentrated around lands already zoned for rural residential use.

Transportation and Travel

General road access to public lands in North Santiam Watershed will continue to be maintained. However, individual BLM-administered roads may be blocked, gated or decommissioned in an effort to reduce road densities or address other resource management objectives. If problems with prohibited uses continue, it may become more likely that more private industrial forest lands would be gated off from public motorized use.

Water Uses

As communities in the North Santiam Watershed continue to grow, conflicts over water quality and water use are also expected to increase. Given that the North Santiam Watershed feeds into the North Santiam River, a major municipal water source, maintaining water quality will become increasingly more important and challenging. Managing point and non-point source pollution and developing a comprehensive water monitoring program in watersheds like the North Santiam may become important management priorities for many of the communities in Salem and the North Santiam Canyon area.

Recreational Uses

As the population in Marion and Linn County and the rest of the Willamette Valley increases, so will the demand for high quality recreation opportunities. In addition to population increases, time and economic constraints may make recreational opportunities close to these communities more desirable. The North Santiam Watershed offers many of the high demand activities in the high demand settings within a day's trip of large population centers and developed sites along the North Santiam River will continue to be popular. At the same time that recreation demand is growing, opportunities for dispersed motorized recreational activities may decrease in the North Santiam Watershed if the trend in gating off private lands continues. This may further increase pressure on private and public lands that are still open to motorized access.

Visual Resources

It is expected that cultural modifications (residential, agriculture, livestock raising, plant nurseries, and timber harvest) in the North Santiam Watershed would continue to be observable. Any proposed projects on federally managed lands would be designed in compliance with their respective Visual Resource Management Guidelines.

Mineral Resources

Rock quarries for road building and maintenance along with recreational mining will continue to be the primary mining activity on public lands in the North Santiam Watershed. No significant increases in the initiation of commercial mining or other right-of-way activities on BLM-administered lands is expected.

Prohibited Uses

Prohibited uses are likely to continue and may increase if actions are not taken to discourage such uses. In addition law enforcement presence cannot be funded, more private property owners may make the decision to close off their lands to public uses. Due to the land ownership pattern in this watershed, addressing these issues needs to be a collaborative process between the major land owners in the watershed.

