



Forest Grove District

Implementation Plan

June 2009

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Introduction

The *Forest Grove District Implementation Plan* guides forest management for all forest resources on the Forest Grove District beginning July 1, 2009. This implementation plan is a major revision of the plan approved by the State Forester in March, 2003. The reasons for the revision include:

- Incorporating New Information – Forest inventory (Stand Level Inventory), yield tables, harvest modeling, and watershed analysis.
- Reflecting Changes in Condition – Land exchanges, threatened and endangered species locations.
- Adjusting Forest Land Management Classifications (FLMC) – The FLMC maps are undergoing a “major change” as defined in OAR 629-035-0060 (3).
- Better Achieving the *Northwest Oregon State Forest Management Plan (FMP)* goals – Current implementation of the plan has not produced the level of volume anticipated when it was approved in 2001.

This implementation plan includes a new landscape design that designates 40 percent of the district for the development of Layered and Older Forest Structure (complex structure) over time. This landscape design will provide better economic performance while placing complex structure in areas it is anticipated to provide the greatest benefit to wildlife.

The implementation plan describes the management approaches and activities that the Forest Grove District will pursue in order to carry out the *Northwest Oregon State Forests Management Plan*) and the northern spotted owl strategies of the draft *Western Oregon State Forests Habitat Conservation Plan (HCP)*. In addition, the management activities conducted under this plan will be consistent with the following State Forests Operational Policies and strategies:

- Northern spotted owls;
- Marbled murrelet;
- Swiss Needle Cast Strategic Plan;
- Salmon Anchor Habitat Strategies; and
- Forest Roads Manual.

The specific operations and management activities necessary to carry out this implementation plan will be described in annual plans, beginning with the *2010 Forest Grove Annual Operations Plan*.

The implementation plan contains a number of format changes to ensure the information is more appropriate for this level of planning. The changes can be found in the following areas: roads, management basins, and harvest calculations.

- Out dated definitions are removed from the Roads sections under the Human Uses and Proposed Management Activities sections
- The Management Basin Descriptions are changed in several ways:

- The Basin Summary Tables are removed due to redundancy with the Information Summary for All Management Basins Table.
- Estimates for harvest and other management activities by basin are expressed more generally because accurate estimates at the basin level of the acres associated with these activities are difficult to predict. Factors such as northern spotted owl locations and market conditions can cause management activities to shift between basins, without affecting the overall level of activity on the district (see Table 6).
- The Information Summary for All Management Basins Table combines the Desired Future Condition Estimate for Regeneration, Closed Single Canopy, and Understory into a single figure. These structures can transition from one to another in relatively short periods of time (10 to 20 years). Therefore, predicting the specific amount each structure in each basin at a date more than 50 years in the future is challenging and does not assist in operational planning.
- The method of calculating the harvest levels is based on a robust computer model. The district analyzes the outputs of this model to identify a sustainable and predictable flow of timber that also achieves the stand structure goals identified in this implementation plan. The range of regeneration and partial cut harvest are used to achieve both the structure and volume goals of the implementation plan.

District Overview

Land Ownership

The Forest Grove District has 115, 010 acres, and makes up roughly the eastern one-third of the Tillamook State Forest. See the district overview map in the **Map Section**. Most of the acres are in Tillamook and Washington counties, but there are also a significant number of acres in Clatsop, Columbia, and Yamhill counties. The acreage breakdown by county is shown in Table 1 below.

Within the district, 114,365 acres are Board of Forestry (BOF) lands, 607 acres are Common School lands (CSL), 21 acres are deed restricted, and 17 acres are administrative sites.

Forest lands adjacent to the northern, eastern, and southern boundaries of the district are mostly privately owned industrial forest lands and interspersed with scattered tracts of Bureau of Land Management and privately owned non-industrial forest lands.

Table 1. Forest Grove District Acres, by County and Fund

County	Board of Forestry	Common School	Consolidated Deeds	Administrative Sites	Total Acres
Tillamook	54,123	197	21	0	54,341
Washington	45,319	257	0	5	45,581
Clatsop	8,595	0	0	0	8,595
Columbia	6,303	77	0	12	6,392
Yamhill	25	76	0	0	101
Total Acres	114,365	607	21	17	115, 010

Forest Land Management Classification System

Below are tables summarizing the Forest Grove District Forest Land Management Classification System (FLMCS). The FLMCS has been implemented in accordance with OAR 629-350-005-, an administrative rule on state forest management adopted by the Board of Forestry in 1998. The district's initial draft of the land classification was completed in 2003 and subject to public review. This revision of the Forest Grove District IP also includes 2009 updates to the FLMCS for the district. The following classifications have been updated: Administrative Sites, Aquatic and Riparian Habitat, Deeds, Domestic Water Use, Energy and Minerals, Operationally Limited, Plants, Recreation, Visual, and Wildlife Habitat.

The FLMCS is a method of describing the management emphasis of parcels of state forest land. The management emphasis identifies the extent to which a parcel of land can be managed for a variety of forest resources. It also identifies when a particular forest resource may need a more focused approach in its management, or possibly an exclusive priority in its management.

The framework of the FLMCS places all state forest land within one of three land management classifications. The classifications are: (1) General Stewardship, (2) Focused Stewardship, and (3) Special Stewardship. Subclasses are assigned for the specific forest resources that require a Focused Stewardship or Special Stewardship Classification.

On General Stewardship lands, all forest resources are actively managed using integrated management strategies, techniques, and practices to meet forest management planning goals. Strategies, techniques, and practices that are used may vary spatially and temporally.

On Focused Stewardship lands, it is necessary to carry out supplemental planning, modified management practices, or compliance with legal or contractual requirements above those required on lands classified as General Stewardship.

One or more of the following characteristics exist on lands classified as Special Stewardship:

1. A legal or contractual constraint dominates the management of the lands and precludes the integrated management of all resources
2. One or more forest resources are present which require a level of protection that precludes the integrated management of all forest resources

Lands are committed to a specific use and management activities are limited to those that are compatible with the specific use.

This revision of the IP also includes a concurrent revision of the FLMCS on the Forest Grove District.

The FLMCS includes some overlapping classifications, defined as areas where two or more classifications occur on the same parcel of land. Overlap may occur within classifications or between classifications. Where overlaps occur between classifications, the resource requiring the highest level of protection will determine the management approach. Also, overlapping classifications cause the double counting of acres. As a result, if the acres shown in the tables below were totaled, the total would be greater than the actual number of acres in the district.

Table 2. Forest Grove District Acres, by Stewardship Class and Fund

Classification	Board of Forestry	Common School	Consolidated Deeds	Administrative Sites	Total Acres
Special	28,810	68	42	18	28,938
Focused	99,625	606	29	0	100,260
General	38,452	147	0	0	38,599

Table 3. Forest Grove District Acres, Focused and Special Stewardship Subclasses

	Acres Focused	Acres Special
Administrative Sites	0	85
Aquatic and Riparian Habitat	30,412	9,128
Cultural Resources	64	16
Deeds	0	0
Domestic Water Use	3,646	0
Easements	0	3
Energy and Minerals	0	71
Operationally Limited	0	10,389
Plants	0	498
Recreation	19,146	141
Research/Monitoring	491	203
Transmission	0	256
Visual	9,771	0
Wildlife Habitat	36,730	8,151

History

In the northern one-third of the district, natural regeneration grew back on a large, contiguous area of the forest after extensive railroad logging and forest fires during the 1930s. These stands developed into a dense coniferous forest consisting of Douglas-fir, true fir, western hemlock, and western redcedar, with Douglas-fir being the predominant species. Several thousand acres of these stands were commercially thinned in the late 1970s and early 1980s. About five percent of the area was poorly stocked, and during this same time period, that portion was clearcut and replanted with Douglas-fir and other conifers, which resulted in well-stocked stands.

The stands in the southern two-thirds of the district lie within the Tillamook Burn, and were created through major reforestation projects in the 1950s, 1960s, and early 1970s, which resulted in densely stocked stands of Douglas-fir. The Tillamook Burn was a series of catastrophic fires in 1933, 1939, and 1945. Before these fires, private timber companies owned most of these lands. Much of the area was accessed with railroad grades used for transporting logs during the pre-Tillamook Burn timber harvest operations. After the 1933 fire, most of these land holdings reverted back to county ownership for delinquent property tax payments. In the 1940s and 1950s, the counties deeded these lands to the state to reforest

and manage. Many acres in the Burn were salvage logged, greatly reducing snag concentrations. During the salvage logging, many miles of old railroad grades were converted into truck access roads.

In the 1960s, 1970s, and early 1980s, clearcut harvests occurred in some of the under-productive stands and mature stands not impacted by the fires, resulting in well-stocked Douglas-fir plantations. Beginning in 1983, small-scale commercial thinning operations began on some of the stands planted after the Tillamook Burn. From 1983 through 1991, commercial thinning operations averaged less than 100 acres per year. From 1992 to the present, the amount of commercial thinning over the entire district has gradually increased to approximately 2,300 acres per year.

From the mid-1970s to the present, most planted stands in the district have had a high survival rate and have been precommercially thinned to reduce stand density. About thirty percent of all stands have been fertilized at least one time.

Physical Elements

Geology and Soils

The Forest Grove District is located in the northern Oregon Coast Range. The rocks in this part of the Coast Range were generally formed by volcanic eruptions associated with the creation of an offshore volcanic island chain and by deposition of sediments in the surrounding shallow seas. These rocks have since been accreted to the continent, uplifted, and eroded to form the rugged topography of the current-day Coast Range. The predominate rock types on the district are diabase sills and dikes (intrusive igneous rocks), basalt flows and breccias and tuffs of the Tillamook Volcanics (extrusive igneous rocks), and marine mudstones and siltstones and sandstones (sedimentary rocks). The rocks are mostly Eocene in age and were formed 35 to 55 million years ago. They have experienced significant amounts of folding and faulting since then due to tectonic activity.

The rugged topography and wet climate combined with the forces of ongoing tectonic uplift and stream down-cutting make the Coast Range inherently prone to landslides. The Coast Range experiences many types of landslides, but in general two types worth noting:

1. Shallow landslides
 - typically less than 10 feet deep and often much less than one acre in size
 - primarily occur on steep slopes (greater than 60%) with shallow soils
 - movement is usually rapid (feet per second)
 - often form debris flows that can increase orders of magnitude in volume and travel long distances (1000's of feet), especially when they enter steep, confined channels
 - generally hard to predict at a site-specific level, so landforms and steep slopes prone to these failures are identified and treated instead
2. Deep-seated landslides
 - typically at least 10 feet deep and up to 100's of acres in size
 - primarily occur on gentle to moderate slopes, often with deep soils

- movement is usually slow (inches a day) and intermittent with years going by in between episodes of movement
- many are ancient features that have not experienced movement for hundreds or thousands of years and are relatively stable
- debris flows can occur on the margins of these landslides, especially where there are critical slope breaks with steeper topography and/or confined channels below
- are often identifiable on soil, geologic, and topographic maps and movement is often a reactivation of a pre-existing landslide feature, however movement may still be hard to predict at a site-specific level

Deep-seated landslides are common on those portions of the Forest Grove District dominated by weak marine sedimentary rocks prone to such landslides. Shallow landslides are common on those portions of the district dominated by steep slopes.

The dominant soil associations within the Forest Grove District include Grindstone, Jewell, and Pinochle (ODF, 1978). The majority of these are colluvial soils, medium to moderately-fine textured, moderately deep to deep, and well-drained. On average, site index ranges between about 100 to 130 (high Site II). Some of the higher elevation soils have a high rock content and exhibit poorer productivity.

Topography

The majority of the district lies in rolling uplands along the crest of the Coast Range. Elevation ranges from 450 feet along Gales Creek to over 3,400 feet on Saddle Mountain. Approximately 7% of the district is below 1000 feet, 63% lies between 1000 and 2000 feet, 29% lies between 2000 and 3000 feet, and 1% is above 3000 feet. The district is dominated by gentle to moderate slopes with steep slopes generally associated with incised stream channels. Steep slopes are more widespread in a few areas including the Salmonberry River watershed and the Wilson River watershed north of Highway 6. Approximately 49% of the district has slopes less than 30 percent, 34% has slopes between 30 and 60 percent, and 17% has slopes over 60 percent.

Water

The district's distinguishing geographic feature is its location in relation to the Coast Range divide. About one-half of the district land base drains to the Pacific Ocean and the other half flows to the Willamette River. Five rivers originate within the Forest Grove District. These include the Nehalem River, Salmonberry River, Wilson River, Tualatin River, and the North Fork Trask River. In addition, nine important tributaries feed into these rivers from within the district: Wolf Creek, North Fork Wolf Creek, Lousignont Creek, North Fork Salmonberry, Gales Creek, Devils Lake Fork, South Fork Wilson, Scoggins Creek, and the North Fork of the North Fork Trask River.

Barney Reservoir lies at the district's southern end and is mostly surrounded by state forest land. Covering approximately 450 acres and with a capacity of 20,000 acre-feet, this reservoir supplies water to much of Washington County.

Climate

Mild winters and summers are typical. Although the higher elevations receive snow each year, there is not always enough to build a snowpack. Rainfall averages from 50 inches per year on the district's eastern edge to 150 inches per year on the western edge near the Coast Range divide. Most precipitation results from low-pressure systems flowing in from the Pacific Ocean. During summers, the prevailing jet stream shifts to the north resulting in high-pressure systems that bring fair, dry weather for extended periods.

Douglas-fir is well suited to almost all portions of the district and makes up approximately 95 percent of the forest cover types; the higher elevations are ideal for growing noble fir. Other tree species that do well in this climate include western hemlock, western redcedar, and red alder.

Natural Disturbances

Natural disturbances such as wildfire, windstorms, floods, landslides, and insect and disease outbreaks have influenced and will continue to influence the forest condition. These disturbances often result in increased forest diversity and complexity. Laminated root rot disease (*Phellinus weirii*) and windstorms are the most common of these disturbances in the Forest Grove District. Forest management will reduce the impact of epidemic natural disturbances, but endemic levels will continue to result in increased forest diversity and complexity.

Biological Elements

Vegetation

All of the Forest Grove District lies within the western hemlock zone (*Tsuga heterophylla*), as classified by the U.S. Forest Service technical report, *Natural Vegetation of Oregon and Washington* (Franklin and Dyrness 1973). Typically, the forest is comprised of heavily stocked stands of Douglas-fir mixed with minor amounts of western hemlock, western redcedar, true fir, and hardwoods. Generally, stands in the northern one-third of the district have a larger percentage of these other tree species than the stands in the southern two-thirds of the district, where the stands are nearly 100 percent Douglas-fir. Stands in the district's northern third are primarily 60 to 70 years old, and the stands in the southern two-thirds are primarily 40 to 50 years old. The most common shrubs and herbs include vine maple, hazel, ocean spray, cascara, huckleberry, salmonberry, salal, sword fern, trillium, and oxalis.

Currently there are seventeen exotic plant species known to exist on the district that are classified by the Oregon Department of Agriculture as "noxious weeds". They are Canada thistle, Scotch broom, Himalayan blackberry, Tansy ragwort, False Brome, Poison-hemlock, common teasel, Herb Robert, English ivy, English holy, Reed canary grass, Evergreen

blackberry, Traveler's joy, Curly dock, Common St. Johnswort, Garlic mustard, and Japanese knotweed. Except for Japanese knotweed, these non-native plants are found scattered in various densities throughout the district. Japanese knotweed is found in one small area in the district. Management and control of noxious weeds is described under **Proposed Management Activities**.

Forest Health

Laminated root disease (*Phellinus weirii*) is a serious concern throughout the district. It is unknown exactly how widespread the disease is. However, surveys have detected it in every basin, with some basins believed to be fifteen percent infected. The disease spreads by root contact with an infected host and is devastating to younger stands of Douglas-fir. Also, this disease may adversely impact true firs and western hemlock. If left untreated the disease will spread at an estimated rate of one to two feet per year, creating openings in the forest which initially will be occupied by brush species and trees that seed in naturally. Eventually, these young trees will be infected and the disease cycle will continue.

Two possible management strategies in stands with significant presence of laminated root disease are regeneration harvest or thin with patch cuts in the disease pockets. In both cases the resulting open spaces may be planted with tree species that are either disease-resistant or immune. In a predominately Douglas-fir forest these strategies will contribute to species and age diversity.

These silvicultural decisions are based largely on the extent and magnitude of the disease within a given stand. It is generally not recommended that Douglas-fir stands be commercially thinned if the disease is present in more than 40 percent of the stand. In these highly infected stands, the best option is often regeneration harvesting and reforestation with immune tree species, or stump removal and replanting with Douglas-fir. While stump removal is expensive it is a very effective way to remove the inoculum from the soil. Where the disease is present in 10 to 40 percent of the stand, thinning with patch cutting of disease pockets may be feasible. In stands with minor amounts of laminated root disease, the disease is often ignored. These management strategies contribute approximately 100 acres per year toward the district's annual regeneration harvest objective.

Additional information regarding this disease may be found in the publication titled *Laminated Root Rot in Western North America* (Thies and Sturrock, 1995).

Currently, Swiss needle cast does not occur in significant amounts within the Forest Grove District. No management constraints are anticipated as a result of Swiss needle cast.

Fish and Wildlife

The Forest Grove District is comprised of a variety of habitat types that support many species of mammals, birds, amphibians, reptiles, and fish. The integrated forest management strategies, as well as the aquatic and riparian strategies, of the *Northwest Oregon State Forests Management Plan*, will contribute to diverse habitats that are likely to accommodate most native fish and wildlife species and contribute to the maintenance and restoration of biodiversity.

Of the many wildlife species potentially found on the Forest Grove District, four are listed as threatened or endangered under either (or both) federal and state Endangered Species Acts: the northern spotted owl, marbled murrelet, bald eagle, and peregrine falcon. The presence of two of these species (northern spotted owl and bald eagle) has been confirmed on the Forest Grove District. The protection measures for the northern spotted owl are described in the *State Forest Program Operation Policies for: Northern Spotted Owls (2008)*, and the *Agreement for the Conservation of Northern Spotted Owls (2001)* (between ODF and the U.S. Fish and Wildlife Service). Protection for bald eagles will be accomplished by developing management plans for nesting territories in cooperation with ODF resource specialists, the Oregon Department of Fish and Wildlife, and adjacent landowners. Management plans will also be developed for winter roost sites or staging areas discovered on state lands, for both resident and wintering migrant eagles. The Forest Grove District has conducted a northern spotted owl survey program since 1990. Currently, there are three known spotted owl sites on the district. One of these sites is classified as “pair status” and the remaining two sites are classified as “resident single status”. Wintering bald eagles have been observed within Forest Grove District, but there are currently no known nest sites. Marbled murrelet surveys have been conducted on the district since 1993, and the presence of murrelets has never been detected. Peregrine falcons have not been observed on this district.

The streams, rivers, lakes, and other water bodies on the Forest Grove District provide habitat for a variety of fish species. There are approximately 194 miles of fish bearing streams on ODF ownership within the district. The Oregon Department of Fish and Wildlife (ODFW) completed stream habitat surveys in the Nehalem, Wilson, and Trask River basins between 1994 and 1996. Fish presence surveys were completed in conjunction with the aquatic habitat surveys. ODFW continues to conduct fish presence surveys on this district, in order to verify the classification of individual streams. Native salmonid species that have been confirmed on the Forest Grove District include chinook salmon, coho salmon, steelhead trout, and coastal cutthroat trout. The North Fork Salmonberry River contains an important native steelhead run. In addition, the Devil’s Lake Fork of the Wilson River, the North Fork of the Trask River, and many tributaries of the upper Nehalem River are important coho streams. Protection measures for listed fish species are described in the *State Forests Salmon Protection Policy (2001)*. In addition, Salmon Anchor Habitats (SAH) are designated in the Upper Rock Creek, Lousignont Creek/Upper Nehalem River, South Fork Salmonberry, Devils Lake Fork Wilson River, Elkhorn Creek and Ben Smith Creek basins. Strategies within the SAH’s are to lower short term risk to salmonids while landscape strategies foster the development of properly functioning aquatic systems and suitable habitat forest-wide. Specific information on salmon strategies can be found at

http://egov.oregon.gov/ODF/STATE_FORESTS/docs/management/IP/13_SAH_and_App_A.pdf). The harvest limits by basin identified in the Salmon Anchor Habitat Strategies will remain in effect through the 2011 AOP and the remaining Salmon Anchor Habitat Strategies will remain in effect through the 2013 AOP

Watershed

Watershed Condition

Three watershed analyses have been conducted on the Forest Grove District: The Upper Nehalem, Trask, and Wilson Watershed Analyses. These watershed analyses cover 70,300 acres on Forest Grove District, or roughly 61% of the district. An action plan has been prepared in response to the Upper Nehalem watershed analysis: this may be accessed at: [http://www.oregon.gov/ODF/STATE FORESTS/docs/Watershed/Upper_Nehalem_WIT_action_plan.pdf](http://www.oregon.gov/ODF/STATE_FORESTS/docs/Watershed/Upper_Nehalem_WIT_action_plan.pdf). The Wilson action plan is still being prepared.

Portions of these watersheds have relatively gentle topography. This lends itself to low gradient streams with abundant pools, which are favored by coho. These portions of the district have a moderate proportion of streams (13%) with high intrinsic potential for coho winter rearing. Under unimpaired conditions, the parts of the district in the Upper Nehalem watershed should be able to support more coho than would other watersheds. There are also sufficient steep streams to provide high intrinsic potential for steelhead (25%), which is comparable with other watersheds in ODF ownership.

Currently, the watersheds were considered to be managed well. Most current detrimental effects were considered to be the result of prior management practices.

Priority actions and management basins where they are most significant include the following:

- Consider opportunities to improve coho habitat: The Wheeler and McGregor management basins (Upper Nehalem watershed) have the highest overall potential for coho habitat. However, High Intrinsic Potential reaches of the Devil's Lake Fork are particularly significant to coho in the Wilson watershed. Thus, they merit special attention.
- Augment key pieces of instream wood: Most management basins were extensively deficient in key pieces, with the exception of the McGregor Basin, and the South Fork Wilson portion of the Rogers basin.
- Improve near-term wood recruitment potential: Wood recruitment potential was lowest in the McGregor, Rogers and Larch management basins.
- Improve long-term (50-100 year) wood recruitment potential by addressing hardwood senescence: Greatest identified issues are in the McGregor and Wheeler management basins.

Human Uses

Forest Management

Table 4 shows the current annual objectives of silvicultural management activities as well as the eight-year average of acres accomplished.

Table 4. Silvicultural Management Activities

Activity	Current Level² (Acres Per Year)	Eight-Year Average (Acres Per Year)
Regeneration Harvest ¹	1,161	597
Partial Cut	1,137	2,609
Reforestation	500	625
Precommercial Thinning	0 ³	248
Fertilization	0 ³	2,211
Pruning	0 ³	91

1. Under Oregon Department of Forestry management, this refers to a regeneration harvest (modified clearcut or retention cut) that removes most trees, but leaves specified numbers of green trees, snags, and down wood to provide structure (habitat) in the new stand.
2. Current harvest levels are taken from the district's most recent annual harvest plan, which is the Fiscal Year 2010 sale plan
3. Customary annual objectives of 300-500 acres of Precommercial Thinning and 2,000-5,000 acres of Fertilization have been eliminated or deferred due to budget constraints for FY 2010. Pruning amounts may also be altered depending on the final budget directions for FY 2010.

Roads

The district's primary road network is an established system that has been in place for about twenty years. It provides access for forest management activities, fire suppression, and public travel. Visions, guiding principles, and goals for managing the district's road network are discussed in the *Northwest Oregon State Forests Management Plan* (January 2001) and the *Forest Roads Manual* (July 2000). The *Forest Roads Manual* also provides standards and guidance for all road management activities and definitions, road classifications and other terms. The State Forests program is nearing completion of specific guidance for conducting transportation planning. The Forest Roads Manual will be revised when this guidance is complete. District priorities for transportation planning are described in Management Basin Descriptions under Resource Considerations and Management Opportunities. Transportation planning will be a priority for basins or blocks determined to have limited or inadequate access.

The district’s total road system consists of mostly collectors and spurs with a few under-standard roads: in total 619 miles of mostly single-lane roads with turnouts. Many of the district’s main roads (collectors) were originally built as railroads and then converted to truck roads in the 1940s and 1950s to standards considerably less stringent than those applied today. Many of these roads were constructed with inadequate drainage systems, poor surfacing, and little regard for slope stability and fish passage.

Most of these roads have been upgraded and now have improved drainage structures, rock surfacing, width, and alignment. There are still a few roads that are a legacy from those earlier decades and need improvement, access restriction or vacating.

The following table shows the approximate number of miles by road use standard:

Table 5. Forest Grove District Road System

Road Classification	Miles
Mainline	13
Collector	210
Spur	395
Administrative	1
Total Miles	619

New information has been gathered about current road conditions and environmental risk with the Upper Nehalem and Wilson watershed analyses (50 percent of the district’s road miles). The information is being used to help identify areas of concern, prioritize needed repairs, and plan road management activities. In addition, District personnel are working on a project team to create a State Forests road information management system. Additional road information will be collected after this system is completed and tested (during this IP period).

Nearly 95 percent of the district’s road miles are surfaced with gravel. The type of surfacing is split between old rock (usually this is natural quarry or pit run rock) and new, crushed rock. Additional crushed rock will be applied to roads, particularly those surfaced with old rock, as part of the district’s ongoing work to upgrade roads.

The Board of Forestry has adopted performance measures for State Forests for stream crossings and hydrologic connectivity. Approximately forty culverts are installed in known fish-bearing streams. Of these, approximately 35 culverts will allow all fish to move upstream and downstream. The remaining culverts are either full or partial barriers to fish passage (blocking upstream passage of all fish or blocking upstream passage of juveniles and/or adults at some stream stages). These culverts will be evaluated for the possibility of mitigating the passage issues or installing new culverts to current fish passage standards.

Hydrologic connectivity measures the proportion of overall road length that drains to streams versus draining to and infiltration into the forest floor. Hydrologic connectivity in

both the Upper Nehalem watershed and the Wilson watershed was 16 percent. This is very close to the State Forests performance measure of 15 percent. Road improvements during this IP period are expected to have road systems meet the hydrologic connectivity target across the District.

The type and level of road activity that will occur during the planning period is discussed in the **Proposed Management Activities** and **Management Basins** sections of this document.

Recreation

The Tillamook State Forest is the largest block of public forest in the north Coast Range and has historically attracted large numbers of campers, anglers, hunters, hikers, off-highway vehicle (OHV) users, mountain bikers, equestrians, and other recreationists. Recreational activities on state forest lands produce significant revenues for local and regional business, and make an important contribution to the regional economy.

Two major highways (Highway 6 and Highway 26) cross the forest, providing direct access to much of the district from the heavily populated Portland metropolitan area. The most heavily used recreation areas in the district are along the Highway 6 corridor and in the Rogers Basin south of the Highway 6 summit.

There are currently five developed fee campgrounds on the district that collectively have been averaging over 8,500 overnight visitors per year. On the district, there are over 50 miles of trail designated for horse, hiker, and mountain bike use in addition to the 60 miles designated exclusively as Off-highway Vehicle (OHV) trail. The Rogers Basin has been designated for OHV use. There are 60 miles of designated OHV trails currently in place in the Rogers Basin. This basin is well known and used by many OHV enthusiasts. The Sunday Creek Basin and the entire area located north of Highway 6 have been designated for non-motorized recreational trail use. The Upper Salmonberry Basin has opportunities for remote recreational experiences, mostly located within the Salmonberry River canyon. Dispersed recreation use (camping, target shooting, etc.) continues to grow across the district.

Recreation management and development activities are described in the **Proposed Management Activities** section.

Scenic

There are a number of important or sensitive visual resource areas within the district. Currently, the most visually sensitive areas include the corridors along the Wilson River Highway (Highway 6) and the Sunset Highway (Highway 26), two established viewpoints, and the areas immediately adjacent to 5 campgrounds. The 2 highway corridors total about 18 miles in length and impact varying distances of adjacent forest land. The Three Mountains viewpoint along the Sunset Highway overlooks the southeast corner of the McGregor Basin. The Gales Creek interpretive kiosk overlooks the western portion of the Gales Creek Basin. The 5 campgrounds are Browns Camp, Stagecoach Horse Camp (Rogers Basin), Elk Creek (Larch Mountain Basin), Gales Creek (Gales Creek Basin), and Reehers Camp (Wheeler Basin).

Forest Stand Structures: Current Condition

The current stand condition is displayed in the graphs on the next page, and in the second map in the **Map Section**. Figure 1 shows the current stand structure, acreage, and percentage, using the structure-based management definitions for structure types. The stand structure abbreviations are given below.

In order to determine the current condition of the stand structure array on the district, an algorithm in the Stand Level Inventory (SLI) was used. The algorithm uses a variety of stand characteristics such as diameter, heights, trees per acre, density, snags, down wood and understory vegetation to determine stand structures.

Currently 53% of the stands on the Forest Grove District have been inventoried. Information for unmeasured stands is generated by imputation. Imputation uses specific information from a single measured stand to represent similar unmeasured stands.

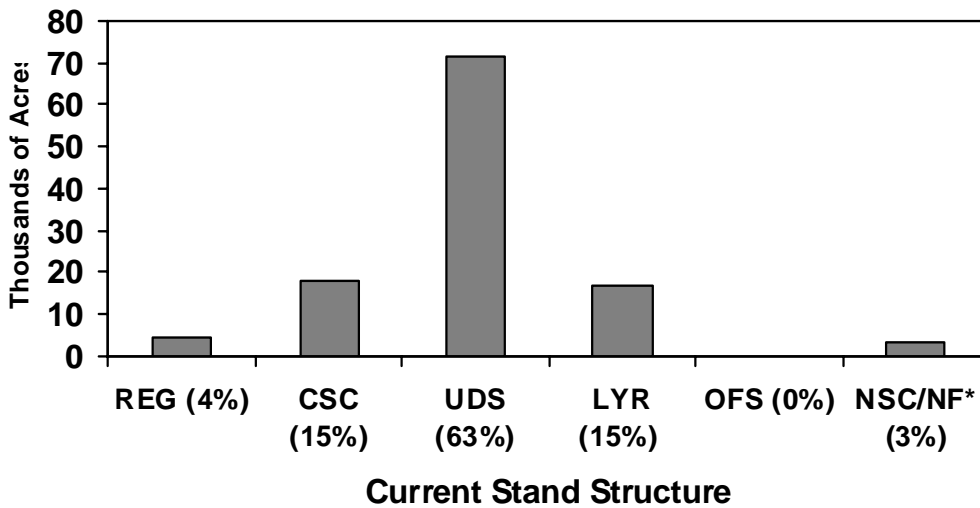
In order to correct any errors from imputed data, all silvicultural prescriptions will be based on actual field reconnaissance during pre-operational analysis and planning, rather than just SLI data.

Figure 2, on the next page, shows the current age distribution of the forest, regardless of structure, by acreage and percentage.

Abbreviations for Forest Stand Types

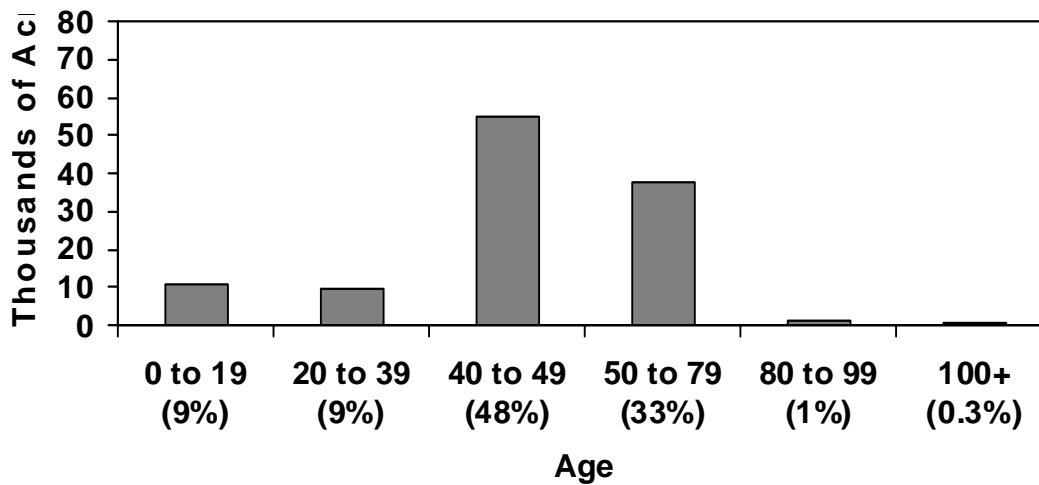
REG	Regeneration
CSC	Closed single canopy
UDS	Understory
LZR	Layered
OFS	Older forest structure
NSC/NF	Non-silviculturally capable/ Non-forest

Figure 1. Current Stand Structure, by Acres and Percent



*Non-forest (NF) lands are those areas, greater than 5 acres that are maintained in a permanently non forest condition. Examples include district offices, work camps and large power line right-of-ways.

Figure 2. Stand Age Distribution, by Acres and Percent



Note: In the above graph, the 9% of less than 20-year-old stands includes the 3% in NSC/NF.

Management Activities

Current Condition Analysis

Stand Structures Interaction

The Current Condition Analysis and the Landscape Design sections of this Implementation Plan describe the amount of each of the identified forest stand types. As described in the forest management plan, the stand types represent only five points along a continuum of forest development. Five “stand” types were developed as a means to plan for and assess the development of the forest toward a range of “forest” types over time. Because the five types are only points along a continuum they do not express five specific habitat types nor are they perceived as discrete habitats by wildlife species. This is discussed in detail in Appendix C of the forest management plan.

As you think about the current condition and desired future condition descriptions as they relate to wildlife habitat keep in mind the following concepts and refer to Appendix C in the forest management plan for more detail.

In an attempt to describe how wildlife may view the forest, they seem to “see” three fundamental patch types. The table below compares these three patch types to the five stand types described in the forest management plan.

**Comparison between
Landscape Patch Types and Stand Types**

Landscape Patch	Stand Type
Young forest	Regeneration through closed single canopy sapling stands
Pole-sized forest	Closed single canopy pole-sized through layered stands
Mature forests	Closed single canopy, understory, layered, and older forest structure stands (trees larger than pole-sized)

Thus, as you examine the current and desired future conditions described by the stand types, it is important to think about combinations and aggregations of different stand types that function together to provide the benefits for each of the three broad patch types that wildlife use.

For example when thinking about the amount of mature forest habitat that will be provided by the anticipated future array of layered and older forest structure stands – also consider the role of understory and closed single canopy stands. The desired future condition was developed to provide a blueprint of a desirable array for the development of the percentage

of layered and older forest structure stand types in the future if natural disturbances allow and management assumptions come to fruition. As described in the table, these stand types will be complemented by adjacent understory and large diameter closed single canopy stands to provide habitat patches that represent mature forests to wildlife species. The result being significantly more acres of mature forest habitat available for wildlife than any single stand type represents.

The entire array of all stand types has not been depicted because it is virtually impossible to predict how each stand on the landscape will develop over the next several decades. By focusing on generally, where we anticipate the development of layered and older forest structure stands, it provides the local manager with the blueprint for the management prescriptions necessary to move the landscape in the desired direction. Future adjustments will undoubtedly have to be made as natural disturbances, insects and disease, or other factors result in some stands not developing in accordance with management plans.

Regeneration

The regeneration (REG) structure comprises 4 percent of the district. This structure is primarily characterized by young (less than or equal to 18 years) even-aged stands of conifer or hardwood seedlings and saplings. However, this structure type has evolved as management strategies and techniques have evolved. Presently, it is not uncommon to find mature live trees, snags, and down wood intermixed throughout this structure. This structure type is widely used by big game animals for foraging habitat.

Closed Single Canopy

The closed single canopy (CSC) structure is at 15 percent of the district. This structure is characterized by the closed crowns of the overstory trees, which prevent light from reaching most of the forest floor. This low light level precludes the introduction of both brush and shade-tolerant conifer species in the understory, thus leaving the forest floor sparsely vegetated. Of all the structure types, this type is the least used by wildlife species, especially species requiring more complex habitats.

The overabundance of CSC on the district can be attributed mainly to the highly successful reforestation efforts following the Tillamook fires, coupled with the relatively small amount of stand density management. Often, stands that were precommercially thinned were thinned too young and/or were not thinned heavily enough to advance these stands into the UDS structure. Closed single canopy stands are found in every basin and vary in age from 20 to 70 years.

Understory

The understory (UDS) stand structure, which accounts for 63 percent of the district, is the most common stand structure. This structure occurs where normal tree mortality, previous density management (precommercial thinning, partial cutting), poor stocking, low growth sites, root disease, or a combination of these factors have prevented the overstory canopy from fully closing. As a result, an understory of herbs, shrubs, and small conifer trees has developed. On good sites in this structure type, large, healthy conifer trees with large crowns

characterize the overstory. Some of these stands began in a low stocked condition, with the overstory canopies eventually closing enough to shade out some of the brush and allow young conifer regeneration to occur.

Poor site class also contributes to the occurrence of this structure across the forest landscape. Site class is usually lowest on rocky, south-facing slopes where both water and nutrients are limited for supporting forest tree species. Therefore, in an environment with few overstory trees, the forest floor has many openings available for understory vegetation.

Diseased stands with advanced degeneration caused by *Phellinus weirii* root rot also fall into the UDS structure type. These infected stands are characterized by the presence of both standing and fallen dead trees, with a brush understory, surrounded by the surviving forest canopy. The fallen trees, having died from root disease, usually do not have roots attached to their trunks. The surrounding forest canopy is often infected or in the process of being infected by the root disease, thus continuing the spread and progression of the disease.

Finally, previous partial cutting also contributes to the presence of this structure. In stands managed through partial cutting, tree density may have been reduced enough to allow for understory vegetation development. The residual trees have increased growth in girth and crown size. In most cases, this structure provides better wildlife habitat, provides more recreation opportunities, is more scenic, provides better tree growth, and stimulates forest health better than the CSC stand structure.

Layered

This structure comprises 15 percent of the district. The shortage of this structure will be the primary factor considered in stand management and landscape design decisions applied across the district.

Older Forest Structure

Currently, older forest structure (OFS) is significantly below the desired target percentage. As shown in Figure 1 and illustrated in the current condition map in the **Map Section**, this structure comprises 0 percent of the district. The shortage of this structure will be the primary factor considered in stand management and landscape design decisions applied across the district.

Non-Silviculturally Capable

By definition, non-silviculturally capable (NSC) lands do not form a single structure type. However, these lands do provide unique and significant habitat contributions to the district landscape. Comprising 3 percent of the district, NSC lands are characterized by geologic and hydrologic conditions unsuitable for the commercial growth and harvest of forest tree species. Geologic conditions include rock cliffs, talus slopes, rock slopes and outcroppings, and other substrate conditions incapable of supporting forest tree species. Hydrologic conditions include floodplains, marshes, beaver ponds, and other aquatic conditions that prevent the growth of forest tree species. These lands provide for plant and animal communities not associated with the other forest structures. Non-Forest lands are

silviculturally capable areas, greater than 5 acres, that are maintained in a permanently non-forest condition. Examples in this district include the South Fork inmate work camp, located in the Rogers basin, and large power line right-of-ways. Non-silviculturally capable and non-forest areas are not considered part of the commercial forest land base and will not be managed for the growth and harvest of forest tree species.

Management Activities in Each Stand Type

This section describes the various management activities and the effects of management for each structure type.

Regeneration Stands

Management practices will be applied to these young stands in order to obtain the greatest value of this structure (rapid tree growth, big game forage, wildlife habitat, etc.). These stands have the potential to move through all of the stand structures toward OFS, depending on current and future landscape designs. All current and future regeneration harvests are designed to incorporate live green trees, snags, and down wood. These structural components in the young plantation will assure proper habitat function of REG stands throughout their growth and development.

Reforestation

Reforestation promptly follows all regeneration harvests and diseased patch harvests down to one-quarter acre in size. Site-specific conditions determine species composition, stock type, and stocking levels. Site preparation, vegetation management, and tree protection activities occur in conjunction with stand establishment and maintenance. Site-specific prescriptions may include broadcast burning, slash piling, herbicide treatments, manual release, and tubing.

Precommercial Thinning

Precommercial thinning (PCT) is an important density management practice that thins out closely spaced trees, including small and defective young trees, in order to provide more water, light, and nutrients for the healthy residual trees. In addition, PCT keeps the canopy from closing, thus preserving the growth of herbaceous vegetation required by big game, while maintaining vigorous tree growth.

Pruning

Pruning may be used in more specialized situations. Pruning removes the lower limbs on the residual trees. It increases the wood quality of the pruned trees, retains big game forage for a longer period of time, and reduces damage caused by bears. Stands with white pine are pruned to prevent infection from white pine blister rust.

Closed Single Canopy Stands

Partial Cut

Past management experience has found that most CSC stands respond well to partial cutting. Not only do the residual trees grow faster, but also complex structures and diverse habitats develop more rapidly, with the creation of snags, down wood, and a shade-tolerant shrub and conifer understory (such as western hemlock, western redcedar, vine maple). Partial cutting improves forest health through increased stand vigor and lower susceptibility to damage from insects, disease, and windthrow, etc. Partial cutting also produces timber, revenue, and enhancements to other resources, including scenic and wildlife resources. Therefore, the majority of current CSC stands will be partial cut, to help these stands develop into the UDS structure. In some areas where either a seed source for shade-tolerant conifer species or advanced regeneration are not present, shade-tolerant conifer species will be underplanted, to assure the development of the UDS structure.

Regeneration Harvest

Regeneration harvest (modified clearcut or retention cut) removes most trees, but leaves specified numbers of green trees, snags, and down wood to provide structure (habitat) in the new stand. The following three subheadings further define the CSC stands that would benefit from regeneration harvest as a silvicultural treatment.

***Phellinus weirii*-infected stands** — An option for CSC stands with *Phellinus weirii* root disease is to regeneration harvest significantly infected areas. This disease can be found in a variety of stages and spatial configurations in all stand structures, and is fatal to Douglas-fir, true fir, and western hemlock. Most infected stands gradually develop significant openings and patches dominated by brush. Infected areas as small as one-quarter acre may be treated by removing all diseased trees and reforesting the openings with disease-resistant tree species, such as western redcedar, western white pine, red alder, or bigleaf maple. Benefits from treating root disease pockets include increased habitat diversity through the creation of small patches or openings, and the incorporation of more diverse tree species into Douglas-fir-dominated stands. Depending upon the size of the openings created, the resulting stands will primarily become UDS with a few isolated REG stands. The primary difference between this treatment in CSC versus UDS stands is the advanced stage of the disease in UDS stands, which results in larger regeneration harvest openings.

Over-dense stands — A management option for over-dense CSC stands is to convert them into REG stands through regeneration harvest and reforestation. Over-dense stands have small crowns, are less vigorous, and are more susceptible to poor health conditions. These dense stands have a low likelihood of being able to respond to partial cutting, which usually leads to high mortality due to windthrow and breakage. Those trees that do not die take a long time to respond to the additional light and nutrients available after the partial cut. Therefore, gains made by partial cutting are negated by the increase in mortality and the slow growth response in these overly dense stands.

Big game foraging habitat opportunities — Openings for big game species and other open area-dependent wildlife species may be created through regeneration harvesting and planting. This management option will be used where landscape design and habitat analysis

indicate the need for REG structure. Openings are important for the health of the big game populations using the Tillamook and Clatsop state forests. Live green trees will be retained, and snags and down wood will be retained or created to complement the new stand.

Understory Stands

Due to the various ways that UDS stands have developed and the differing vegetation compositions of the understory, a variety of stand management options will be pursued to address the stand-specific conditions associated with this structure type.

Partial Cut

For UDS stands that have a sparse to moderate overstory and are stocked with a healthy conifer understory, are on lower site soils, or are the result of partial cutting, the preferred management option will be to develop these stands into the LYR structure. In the majority of cases, these stands will be monitored until the overstory begins to shade out and suppress the understory. At that time, a partial cut will be done to release the understory while maintaining the health and vigor of the remaining overstory. This prescription will maintain the growth rates of both the overstory and understory while advancing the stand into the next level of structure complexity. In addition, snags and down wood will be recruited within stands deficient in these important structural habitat components.

Regeneration Harvest

The following two subheadings further define the UDS stands that would benefit from this silvicultural treatment.

***Phellinus weirii*-infected stands** — An option for UDS stands with a significant amount of *Phellinus weirii* root disease is to regeneration harvest the infected areas. In some cases, the harvest units may be a series of small patch cuts, 1 to 10 acres. In other cases where the disease is widespread and diffuse, harvest units may be 10 to 120 acres. These harvest units are usually defined by roads or streams so as to provide a barrier to future root contact from adjacent stands that may still contain the disease. Although it is impossible to completely eradicate laminated root disease from the landscape, these harvest practices will retard the spread of the disease. Additional benefits include increased habitat diversity through the creation of the REG structure, and the incorporation of more diverse tree species into Douglas-fir-dominated stands.

Low-stocked stands — In UDS stands that are poorly stocked, and have a brush understory, the preferred management option is to regeneration harvest and reforest with a healthy stand of trees. In these poorly stocked stands, the emphasis will be to reforest the site with a well-stocked plantation using a natural combination of conifer species. These sites will be converted to vigorous young stands of REG structure while providing foraging habitat for big game. In addition, live green trees will be retained and snags and down wood will be retained or created to complement the new stand.

Layered Stands

Partial Cut

LJR stands will either be left unmanaged until more stands of similar structural complexity are developed, or these stands will be partial cut to further their development in structural complexity toward OFS. The majority of the stands currently identified in this structure type are deficient in snag and down wood levels. Therefore, in addition to opening up the canopy to enhance residual overstory tree growth and understory development, snags and down wood will be recruited in stands deficient in these components.

Regeneration Harvest

LJR stands will be considered for regeneration harvest only with sufficient justification. In a few cases, LJR stands may be regeneration harvested and reforested when these stands become surplus to the desired future condition target. In these cases, the result will be to create a new conifer REG stand of vigorously growing trees while maintaining many of the structural components of the previous stand. These structural components include old growth trees, live green trees, snags, and down wood.

Older Forest Structure Stands

Partial Cut

OFS stands will for the most part be left unmanaged during this planning period. It is conceivable that a dense stand of OFS could be partial cut to promote increased overstory tree diameter growth and understory tree response. This would also be an opportunity to create additional hard snags and large down wood within the stand. In no case shall OFS stands be regeneration harvested during this planning period.

Proposed Management Activities

This section describes the management activities that will be accomplished in Fiscal Years 2010 through 2019.

Silvicultural Activities

Table 6. Annual Silvicultural Activities for Fiscal Years 2010 to 2019

Activity	Estimated Annual Acreages
Partial cut	600 - 2,500 acres ¹
Regeneration Harvest	300 – 1,350 acres ^{2,3}
Reforestation	300-1,425 ⁴
Precommercial Thinning	0 – 400 acres ⁵
Fertilization	0 – 2,500 acres ⁵

1. Diseased patch cuts less than five acres will count toward the annual partial cut objective.
2. For this 10-year planning period, stands currently identified as OFS will not be considered for regeneration harvest.
3. Diseased patch cuts greater than five acres will count toward the annual regeneration harvest total.
4. Reforestation acres are higher than regeneration harvest acres because it is anticipated that 3 to 5 percent of the partial cut acres will be reforested, where trees infected with *Phellinus weirii* have been removed, forming small openings in the stand approximately one-quarter to five acres.
5. The acres shown represent a range dependent on annual workloads and budget levels. In years of low fiscal budget levels, these estimates could fall to zero.

See Appendix A for additional information on the rationale and method applied to determine the proposed silvicultural activities in Table 6 above.

Roads

Guidance for achieving the desired condition will come from the *Forest Roads Manual* (ODF, July 2000).

Potential Road Activities

To accomplish the district's silvicultural objectives, it is estimated that between 85 and 125 miles of new road construction and between 135 and 170 miles of road improvement will be necessary over the entire district during the planning period. Road construction and improvement identified in this plan will be primarily achieved through project work connected with timber sales. Additional details can be found in the **Management Basins** section of this document. Roads will be maintained as necessary to protect water quality and the road system asset value. Road maintenance activities will follow the maintenance guidance in Chapter 7 of the *Forest Roads Manual*.

No new mainline roads will be required. Approximately 80 percent of the roads to be constructed will be single spur roads within timber sale areas. These spurs will be narrow and have lengths between 0.1 and 1.5 miles. Collectors that connect these sale areas to the mainline system make up the remaining 20 percent, and in most cases, will access other future timber sales. Many of these same roads will be used for numerous management activities over the next several decades.

Table 7. Average Yearly Road Activities under the 2003 IP in the Fiscal Years 2003 – 2008

Activity	Estimated Annual Mileage
New Construction	16.5 miles rocked road; 0.2 miles dirt road
Road Improvement	16.5 miles
Road Vacating	1.2 miles

Slope Stability

Landslides occur naturally throughout the district. Sediment delivered by landslides to streams can have adverse short-term effects on water quality and fish habitat. However, large wood, boulders, and gravel delivered by landslides to streams can have positive long-term effects to fish habitat by providing increased structure. The Forest Management Plan recognizes the importance of ensuring that landslides deliver large wood to streams when they occur.

Landslide hazards may be exacerbated by management activities. Timber harvest may reduce root strength affecting overall soil strength and increasing susceptibility to shallow landslides. Timber harvest may also reduce canopy interception of rainfall affecting slope hydrology and increasing susceptibility to shallow landslides and potentially deep-seated landslides as well. Standing timber, as well as large downed wood, tends to reduce debris

flow travel distances. Roads may affect slope stability by altering slope geometry with cuts and fills and by altering slope hydrology.

Many existing landslides as well as areas with potential for future landslides are identified in available soil surveys and geologic maps. They can also be identified using topographic maps and data. LiDAR-generated topographic maps and data are especially useful for identifying and assessing landslide hazards.

The Area Geotechnical Specialist provides technical consultation to the district on slope stability issues so that they can make good management decisions. The Area Geotechnical Specialist reviews all planned road and harvesting operations during the annual operations planning process and conducts landslide hazard and risk assessments for the protection of natural resources and public safety. This is done through a combination of map and photo review as well as field reconnaissance and investigation. Potential landslide issues are also identified by the district during field reconnaissance, operation layout, and during administration of active operations and the Area Geotechnical Specialist is consulted as necessary.

Depending on the level of hazard and risk, existing landslides and potential landslides are avoided during road and harvesting operations. If they cannot be avoided, then the district consults with the Area Geotechnical Specialist to assess their options and to better understand the hazard, risk, and potential mitigation strategies associated with each option. The Forest Management Plan refers to specific mitigation strategies including leaving trees along streams prone to debris flows. The Area Geotechnical Specialist documents the assessment, including findings and recommendations.

Recreation

During 2009-2010, the District will be working with the State Forests Division to address recommendations that stem from the *Second Party Recreation Assessment* and the subsequent *Recreation Action Plan*, which will include:

- carefully examining the role that State Forest recreation plays in a regional context of outdoor recreation opportunities and providers;
- developing goals commensurate with the agency's role and capabilities;
- defining the commitment of State Forests to provide recreation opportunities for local and regional users;
- conducting a recreation program workload analysis that can help ensure that individual Districts have properly identified the resources they need to achieve objectives and commitments;
- addressing specific gaps in existing standards, policies and procedures;
- embarking upon on a process to articulate a clear vision of the role of State Forest lands to provide recreation, with participation from the Board of Forestry

In the near-term however, financial resources are limited, necessitating that recreation related resources and workloads be focused primarily on maintaining the existing

infrastructure. New projects or those being eyed for the foreseeable future will depend heavily on successfully securing grant funding and volunteer assistance. Reliance upon established and committed partnerships with local user groups and advisory committees will continue in an effort to try and meet recreation related needs and demands.

Existing Facilities and Programs

Public safety and law enforcement – The district is part of a thirteen-year old cooperative program with Tillamook district and Tillamook County Sheriffs Department to maintain a consistent regulatory and enforcement presence in the forest. To provide this presence, three Tillamook County Sheriffs deputies are contracted to provide full time coverage throughout the year. Patrol and public contact by ODF staff is a necessary part of this effort. In addition, the ODF sponsored Trail Patrol volunteer program provides assistance and information to off-highway vehicle and non-motorized trail users, as well as assistance to the Sheriffs department for search and rescue efforts.

Providing information and education to the public through a wide range of recreation guides, maps and brochures is also an important component of public safety. As identified in *Recreation Action Plan 2000*, the district will continue to enhance systems to provide updates concerning trail and road closures due to harvest operations, repair needs, authorized events or other reasons.

Continuing the law enforcement program and the other associated efforts at current levels is considered vital to providing a reasonable level of public safety and protection to the resource and recreation facilities.

Management and maintenance — The basic recreation program management and maintenance workload will continue to increase as visitation increases. The trail system demands a high level of maintenance to minimize trail damage and water quality problems. Approximately 50 to 65 percent of the total trail system will require maintenance each year. In addition, a percentage of the OHV trails need the surfacing upgraded in order to handle the level of use and prevent damage. Other types of maintenance workloads and costs include garbage and recycling service, vault toilet cleaning and pumping, well maintenance, sign replacement and maintenance, trailbridge repair, vegetation control, resource enhancement, and vandalism repairs.

Volunteer program — The recruitment and use of volunteers is critical to the overall success of the recreation program. The volunteer program takes a substantial amount of dedicated staff time for effective planning and use of volunteers. The district currently manages a volunteer program that includes the following recreation sub-programs.

- | | |
|----------------|------------------------------------|
| Camp hosts | Trail maintenance and construction |
| Adopt- a-Trail | Trail patrol |
| Forest cleanup | Trail machine volunteer operator |

These programs are expected to grow. It is estimated that there will be a 10 to 15 percent increase in volunteer hours and accomplishments if staffing levels remain constant over the next several years.

Event management — The Forest Grove District permits organized club-sponsored trail use events. Both motorized and non-motorized trail events are held on the district. On the average, six to eight OHV (off-highway vehicle) events are permitted on the district each year. The events consist of poker runs (fun runs), competitive timed motorcycle races, trials motorcycle competitions, four-wheel drive rallies, and competitive four-wheel drive events. The OHV events occur within the Rogers Basin. Other events, such as equestrian poker rides, mountain bike races, archery competitions, and education-related events are scheduled less frequently and primarily occur within the Gales Creek and Wheeler basins.

Aquatic Resources — Stream Enhancement Projects

Stream enhancement projects will be accomplished in accordance with the *Oregon Plan for Salmon and Watersheds* and in consultation with the Oregon Department of Fish and Wildlife (ODFW). Candidates for instream habitat enhancement will be identified by ODFW and watershed assessments performed on the district. To date watershed assessments have been completed for the Trask, Upper Nehalem and the Wilson River watersheds.

Specific projects on candidate streams will be identified during the AOP process in a cooperative effort between district personnel and ODFW biologists. Stream enhancement projects may include placement of large wood or boulders within a stream, re-establishment of historical channels, development of off-channel habitat, or riparian vegetation planting. ODFW will provide input on the actual design and location of enhancement work. The Department of Forestry will verify feasibility, provide necessary materials, appraise the cost of work, and prepare and administer the stream enhancement contracts. The district estimates that one project per year may occur during the implementation plan time frame. ODFW biologists have identified the Upper Nehalem River (above Reehers Camp), Olsen Creek and portions of the North Fork of Wolf Creek as high priority streams for enhancement.

Cultural Resources

- A cultural resource inventory was developed and completed in August, 2002. Revisions and updates will continue throughout the 10-year implementation planning period.
- Inventoried cultural resource sites will be evaluated to determine the appropriate protection class (Class I, II, or III).
- Potential operation areas will be checked against the cultural resource site inventory for the district to see if any sites are in or adjacent to the operation area.
- Sites that are within or adjacent to a proposed operation that has the potential to impact the site, and which have not been assessed for class designation, will be evaluated to determine the appropriate cultural resource class.
- Class I sites will be protected according to the legal standards in the applicable laws.

- Protection of Class II or III sites will be based on field inspection of the site and consultation with the appropriate Department of Forestry or other specialist.

Energy and Mineral Resources

The district will locate, assess, and plan for aggregate rock sources where adequate sources for future management are not currently identified. The district will assess existing sources to determine the amount and quality of rock present. Finally, the district will create quarry development and reclamation plans based on the assessment data, estimated long-term needs, and resource protection issues.

Lands and Access

The district will carry out the following activities.

- Continue to pursue land exchange opportunities when:
 - (1) The transaction furthers the purposes of ORS 530.010, the acquisition of lands chiefly valuable for the production of forest crops, watershed protection and development, erosion control, grazing, recreation or forest administration purposes; and
 - (2) The exchange furthers the objectives of achieving greatest permanent value as defined in OAR 629-035-0020 as expressed in the approved forest management plan; and
 - (3) The transaction results in the consolidation of state forest lands, or makes management of state-owned forest lands more economically feasible.
- Follow current Board of Forestry policies for land acquisitions and exchanges and the Administrative Rule for State Forest Land Acquisitions and Exchanges (Chapter 629, Division 33).
- Complete a land exchange and acquisition plan, as required (OAR 629-033-0015).
- Maintain the inventory of property corners and lines.
- The establishment and maintenance of property corners and lines will be prioritized and scheduled through the Annual Operations Plans.

Scenic Resources

The district will carry out the following activities:

- Complete the mapping of high sensitivity areas using the criteria detailed in the *Northwest Oregon State Forests Management Plan* strategies (pp 4-105 to 4-107) and the Forest Land Management Classification guidelines.
- Identify and map moderate and low sensitivity areas using the criteria in the *Northwest Oregon State Forests Management Plan* strategies (pp 4-106 to 4-107).
- Prior to completion of moderate and low sensitivity area mapping, areas not initially identified as high sensitivity will be evaluated at the time of a proposed operation

(with the potential for an adverse visual impact) to determine if the area is moderate or low sensitivity.

- Proposed operations in high and moderate sensitivity areas will be evaluated to determine appropriate landscape and/or stand-level prescriptions necessary to mitigate the visual impacts consistent with the management objectives in the strategies.
- The resource analysis section of the annual plan will include an evaluation of the potential visual impacts and a description of the landscape and/or stand-level prescription that will be applied.

Plants

The district will protect plant species in accordance with state and federal Endangered Species Acts. In addition to Endangered and Threatened plants, the district will also make provisions for candidate and special plants. The District Plant List (Table 8) includes endangered, threatened, candidate, and special concern plants that are, or have the potential to be found, on the district. This list is an expanded version of the list found in the *Northwest Oregon State Forests Management Plan* (pg 2-62).

This will be accomplished by the following:

- During the planning of forest operations, the district will determine whether the proposed operation areas contain a plant on the District Plant List. This determination will be made by reviewing the Oregon Natural Heritage Program (ONHP) database for rare plant locations. In addition, the district will use its local knowledge on rare plant locations and habitat requirements.
- When the district has determined that a plant from its list may occur within an operation area, it will consult with the Oregon Department of Agriculture (ODA) to determine the appropriate level of protection. If ODA deems a field survey is necessary due to the presence of listed plants and/or habitats, the survey results will be submitted to ODA. Survey methods and survey results will comply with OAR 603-73-090 5(C).
- The district will contribute all information about rare plant locations to ONHP so that the database is kept updated.

The NWFMP Forest Health Strategies call for monitoring pest populations, damage levels and trends, to use Integrated Pest Management (IPM) to suppress or prevent damaging pest populations, and to cooperate with other agencies and associations to prevent the introduction of non-native pests. (pg. 4-77 to 4-79). Implementation Plans address how individual Districts will contribute to statewide efforts to reduce the quantity and range of invasive, non-native plant species.

Recent draft Policy and Procedures prepared for the State Forest Division articulates how active Invasive Weed Management should be pursued, and summons the Districts to prepare a weed management plan. District Invasive Weed Management plans will be developed and used to guide the management of invasive weeds on Oregon Department of Forestry

managed lands. These plans are meant to be dynamic documents. During their initial development information may be incomplete or lacking, which can be added as it becomes available or management strategies change.

Invasive Weed Management plans are designed to outline a comprehensive approach to the management of invasive plants on both Board of Forestry and Common School Fund lands. It is intended to specifically address the goals, priorities and strategies for prevention, early detection, rapid response, and monitoring of invasive plant occurrences on the District. Additionally, it should address efforts and activities to enhance internal education and awareness.

The noxious weed species currently found on the district are Canada thistle, Scotch broom, Himalayan blackberry, Tansy ragwort, False Brome, Poison-hemlock, common teasel, Herb Robert, English ivy, English holly, Reed canary grass, Evergreen blackberry, Traveler's joy, Curly dock, Common St. Johnswort, Garlic mustard, and Japanese knotweed. These species will be actively controlled or eradicated.

Generally, species found in small amounts will be eradicated. Japanese knotweed is a plant that fits this category. This will be accomplished using hand and chemical controls as well as continued monitoring of the site.

The other noxious weed species are found scattered throughout the district and will be "actively controlled" because to eradicate them would be impractical. In some cases, "actively controlled" may only mean monitoring their spread and impact through doing stand exams, stocking surveys and road inventory. In other cases, actual control activities, such as roadside spray application, will be identified and included as part of the annual operations plan.

Table 8. Forest Grove District Endangered, Threatened or Candidate Plant Species

Genus	Species	Subspecies	Common name ¹	Record Status exists ²	Potential to be present
Threatened and Endangered Plants					
<i>Erigeron</i>	<i>decumbens</i>		Willamette daisy	SE, FE	✓
<i>Erythronium</i>	<i>elegans</i>		Coast Range fawn-lily	ST	✓
<i>Lupinus</i>	<i>sulphureus</i>	<i>kincaidii</i>	Kincaids lupine	ST, FT	✓
<i>Sidalcea</i>	<i>nelsoniana</i>		Nelson's checkermallow	ST, FT ✓	
Plants of Special Concern					
<i>Castilleja</i>	<i>chambersii</i>		Chamber's paintbrush	SP	✓
<i>Dodecatheon</i>	<i>austrofrigidum</i>		Frigid shootingstar	SP	✓
Candidate Plants					
<i>Cardamine</i>	<i>pattersonii</i>		Saddle Mt. bittercress	SC	✓
<i>Filipendula</i>	<i>occidentalis</i>		Queen-of-the-forest	SC	✓
<i>Saxifraga</i>	<i>hitchcockiana</i>		Saddle Mt. saxifrage	SC	✓
<i>Sidalcea</i>	<i>hirtipes</i>		Bristly-stemmed sidalcea	SC	✓
<i>Sullivantia</i>	<i>oregana</i>		Oregon sullivantia	SC	✓

¹Plant names in bold are on the NW FMP list of plants.

²Plants have been observed on or in close proximity to state forestlands.

Status:

SE – State Endangered

ST – State Threatened

SC – State Candidate

SP – Special Concern

FE – Federal Endangered

FT – Federal Threatened

Special Forest Products

The district will carry out the following activities.

- Provide permits to harvest special forest products on a request basis, consistent with product availability, protection requirements, and other resource management strategies.
- Periodically review and update district policies, procedures, and product price listings.
- Share special forest product information between districts and communicate permit information with adjacent landowners.
- Assess the need and capability for a special forest product planning program that could: (a) identify major products that would be emphasized on the district, (b) delineate logical sale units and personal use areas, and (c) develop a harvest schedule based on the productivity of special forest products for both commercial harvesting and personal use.

Landscape Design Overview

The Forest Grove District has eleven basins. Of this total, seven basins comprise 90 percent of the district's acres. The district is bordered on the west by state forest land within the Tillamook District. The north and east sides of the district are bordered primarily by private industrial forest land. To the south is an even mix of Bureau of Land Management (BLM) and private industrial forest land. There is also a 4,500-acre isolated tract of state ownership in Columbia County, which is surrounded by private forest land. In addition to the large amount of private industrial forest land to the east and north, there is a 13,000-acre tract of private industrial forest land located in the center of the main body of the district.

A desired future condition map can be found in the attached **Map Section**. The landscape design process was a collaborative effort between the district, resource specialists and ODFW biologists. The district intends to achieve the desired future condition of 40% complex stands on the district by designating areas for older forest structure (OFS) and layered (LYR) stand structures across the landscape, ensuring a variety of forest patch sizes and shapes that provide connectivity between watersheds, and dispersal habitat for wildlife. The overall design will also include habitats necessary for those species needing more open conditions.

Two main strategies will be used in the placement of these future complex forest structures.

The first strategy will be to place complex stand structures on sites where structural components of mature forests can be rapidly achieved (20 years from present), where access is good, and the risk to other resources is low. This strategy can be accomplished by partial cutting stands on high site ground where the trees will respond readily with increased growth. The desired future complex stands will be achieved by this strategy. These potential complex stands are located in areas important for northern spotted owl habitat, adjacent to streams within certain salmon anchor habitat basins, along anadromous fish bearing streams or in areas that provide opportunities for connectivity between complex stands.

The second strategy will achieve the desired future complex stands on sites where resource protection can be maximized or where other resource values have a higher management priority. These areas have steep slopes, low site, and poor access. In many cases, conventional road building and timber harvest operations may not be feasible; thus the development of complex forest structures may take longer to achieve (60 years or more from present). These stands will further the enhancement of habitat for the northern spotted owl, salmon anchor habitat basins and basins with anadromous fish as well as enhance areas with other considerations such as recreation and visual. As mentioned before, this may require less conventional means such as helicopter logging, when market conditions make this economically feasible.

Stand origin and age were not heavily considered when developing the district's landscape design. With the vast majority of the stands being between age 40 and 80, and because of the time it will take to meet our desired future condition, it was decided that other resource issues and landscape design principles would drive the landscape design process. However,

some younger stands may be included in the desired future development of OFS and LYR because the location of these stands and the potential stand contributions would best benefit the landscape design goals.

Areas identified for the first strategy are located in the McGregor Basin, Wheeler Basin, Gales Creek Basin, Upper Salmonberry Basin, Larch Mountain Basin and the Sunday Creek Basin. It is important to achieve these complex forest structures as quickly as possible in these areas. The McGregor Basin is primarily bordered by private forest land on three sides, making this important northern spotted owl dispersal habitat linking the Jewell northern spotted owl cluster with developing owl habitat to the south in the Wheeler Basin. Approximately 6,150 acres in the north half of Wheeler Basin, 1,600 acres in the McGregor Basin and 410 acres in the Upper Salmonberry Basin have been designated as a northern spotted owl cluster. Additional planning will be required in the cluster to ensure the development of high quality northern spotted owl habitat, while maintaining habitat for the spotted owls currently residing in this area.

The eastern area of the Gales Creek Basin (known as Wildcat Mountain) has been mostly designated for complex stands. This 2,522 acre area is completely surrounded by private forest land.

The western portion of the Gales Creek Basin and the eastern half of the Sunday Creek Basin are important headwater areas, particularly for water quality issues. Large areas of contiguous complex structures (2,000 acres) have been designated OFS and LYR within these headwater areas.

Areas identified for the second strategy include the Kings and Elk Mountain area in the western Larch Mountain Basin, the Scoggins Creek Basin, the northern portion of the McGregor Basin, portions of the Wilark Basin, and the west half of the Gales Creek Basin along Gales Creek and Drift Creek. As mentioned above, these are mostly steep, low site areas where trees develop slowly or are stands where there are higher levels of snags and down wood and can provide connectivity to areas identified in the first strategy.

Large areas (2,000 to 6,000 acres) of complex structures will create large interior habitat areas for future dispersal habitat, and will provide enhanced protection for many resources. Examples include: riparian areas, large interior habitat areas, northern spotted owl dispersal habitat, important salmonid streams, and areas emphasizing water quality, site quality, slope stability, and scenic and recreational resources.

In areas with slope stability concerns, OFS and LYR stand structures, coupled with proper road building and road maintenance, will significantly reduce the probability of slope failure. In addition, having older, more complex stand structures located below potential landslide initiation areas will lead to properly functioning landslides—that is, debris deposits will contribute large woody material and gravels that develop into stream structure and enhance habitats through natural geologic processes.

For the next 30 to 40 years, areas not designated to be OFS or LYR will provide the pool from which regeneration (REG) and understory (UDS) stand structures will be created. These stand structures will be arranged across the rest of the landscape, based on habitat, resources, and logistical and operational needs and constraints. The closed single canopy

(CSC) stand structure will not be purposely designed in the landscape design. It will be identified and mapped as stands move into that stand structure.

Implementation of Landscape Design Maps

The landscape design map represents the district's current vision of where complex structures will be developed over time. The district will use this map in the planning of harvest operations and the designing of silvicultural prescriptions. Through the course of implementation, however, refinements to the landscape design map are likely to occur due to stand conditions, harvest efficiency and operability concerns, or new information

Generally, harvest operations at sites designated for complex structure will be partial cuts or retention harvests designed to develop complex structure over time. New information about an existing stand however, such as insect or disease presence, stand density, or some other condition, may indicate that a regeneration harvest is the most appropriate silvicultural prescription for the stand. In these cases, the Pre-Operations Report for the harvest operation in the Annual Operations Plan will describe why it is not appropriate to develop the current stand into complex structure and how the resulting plantation will be the best option to develop complex structure in the shortest timeframe.

The district may identify a site designated for the development of complex structure on the landscape design map that is not currently suitable for the development of complex structure. Examples include: sites that are not suitable for partial cut harvesting or sites that are infected with a root rot and require one or more rotations of alder before complex structure can be developed. In these cases the landscape design may be changed, replacing the less desirable site with a site of comparable acreage that is better suited for the development of complex structure.

Changes to the landscape design will be fully described in an Annual Operations Plan and will not exceed 240 acres in a year. The complex structure goal will remain consistent with the BOF direction that calls for the District to develop complex structure across 40 percent of its landscape, with 20 percent to be achieved within 20 years. The landscape design map will be fully reviewed with any major revision of the district implementation plan.

Management Basins

Management Basins Overview

The district is divided into 11 management basins ranging in size from 554 acres to 20,834 acres. The main body of the district is divided into 7 basins, which are between 10,618 acres and 20,834 acres in size. These basins were delineated using a combination of watershed boundaries and major highways. The 4 remaining basins are located to the south, east, and northeast of the main body of the district, and were delineated using drainage and ownership patterns.

Information Summary for All Management Basins

Table 9. Summary: Current Condition* (CC) and Desired Future Condition (DFC), by Stand Structure and Percentage

Management Basin	Acres	NSC/ Non- Forest**	REG	CSC	UDS	NON	COMPLEX CONDITION			
						COMPLEX CONDITION	LYR		OFS	
		CC*	CC	CC	CC	DFC**	CC	DFC	CC	DFC
Bell Mountain	1,728	0	18	47	35	100	0	0	0	0
East District Isolated Tracts	554	0	7	1	38	100	54	0	0	0
Gales Creek	10,166	0	4	11	62	29	22	34	0	37
Larch Mountain	13,160	13	4	20	61	45	2	47	0	8
McGregor	10,618	1	8	14	59	61	18	17	0	22
Rogers	20,834	3	3	19	56	78	19	10	0	12
Scoggins Creek	3,018	0	10	4	86	80	0	20	0	0
Sunday Creek	15,239	3	1	5	83	79	8	11	0	10
Upper Salmonberry	18,955	3	1	11	63	51	22	17	0	32
Wheeler	16,141	<1	5	21	57	44	17	20	0	36
Wilark	4,596	1	11	36	39	85	13	15	3	0
District Total	115,010	3	4	15	63	60	15	20	0	20

* The Current Condition was determined using the latest Stand Level Inventory imputed 9/15/2008.

** The Desired Future Condition will be achieved in an estimated 50 to 60 years.

*** NSC/Non-Forest (Non-Silviculturally Capable and Non-Forest lands). Non-Silviculturally Capable lands are not capable of growing forest tree species (defined in OAR 629-035-0040). Non-Forest lands are those areas, greater than 5 acres, that are maintained in a permanently no forest condition (example include district offices, work camps and large power line right-of-ways).

Information Summary (continued)

In the *Northwest Oregon State Forests Management Plan* (pg 4-48), the ranges for the desired future condition of stand structure types were outlined. These ranges are given below.

Regeneration (REG)	5–15%
Closed Single Canopy (CSC)	10–20%
Understory (UDS)	15–35%
Layered (LYR)	20–30%
Older Forest Structure (OFS)	20–30%

Table 9 on the previous page shows that for the Forest Grove District's desired future condition, the planned percentages of stand structure types fall within the management plan ranges. The desired future condition map in the **Map Section** shows potential future stand structure across the district.

The time required to achieve this desired future condition depends on site quality and density management. In general, the desired future condition should be achieved in 20 years for the complex stands identified in the first strategy and approximately 50 to 60 years for the remaining complex stands. In all cases, the achievement of the desired structure percentages is limited by the current shortage of OFS. On higher quality sites (site classes 1, 2, or 3), active density management (i.e., partial cutting) should be able to produce OFS in a relatively short time period. On lower quality sites (site classes 4 or 5), where little or no density management occurs, it will take longer to achieve OFS.

Basin Descriptions

Bell Mountain Basin

Bell Mountain Basin is located in the Nestucca River watershed. It is comprised of 9 isolated, state-owned parcels totaling 1,728 acres, and is mostly surrounded by BLM forest lands. The majority of the BLM land is comprised of complex forest structures, and is currently being managed as late successional reserves. Most of the state forest land is comprised of young, less complex stand structures (REG and UDS).

Approximately 6 to 8 miles of OHV trails currently exist in the basin. Trails on state land provide access and connection to the larger OHV network located on BLM land.

Key Resource Considerations for Bell Mountain Basin

- A high percentage of the BLM land in this basin is comprised of complex stand structures.
- All the state tracts in this basin are priority candidates to exchange for BLM parcels within the main block of the Tillamook State Forest.

- Approximately 6 to 8 miles of OHV trails currently exist in the basin. Trails on state land provide access and connection to the larger OHV network located on BLM land.
- There are 1.2 miles of fish bearing (Type F) streams located in this basin.
- The transportation system provides good access; construction of a few spurs and some road improvement are all that are needed.

Desired Future Condition and Landscape Design

Currently there are no planned complex stands within this basin.

Management Opportunities

Harvest – There is one potential regeneration harvest opportunity in this basin.

Transportation – This basin is a low priority for planning and/or investments in the infrastructure. Road construction and improvement will be at a lower rate than the last ten years.

East District Isolated Tracts Basin

These 8 isolated tracts, widely scattered along the eastern edge of the district, total 554 acres and range in size from 4 acres to 140 acres. Privately owned land surrounds most of the parcels, and 3 parcels are also adjacent to BLM land. These tracts represent a wide range of stand ages from 15 to 75 years old. These scattered tracts are all candidates for exchange.

Key Resource Considerations for East District Isolated Tracts Basin

- The tracts in this basin are isolated and a high priority to exchange for parcels adjacent to or within the main block of the Tillamook State Forest.
- There is a total of 2 miles of fish bearing (Type F) streams in this basin.
- The transportation system provides limited access; access to some parcels is good but some parcels need access developed.

Desired Future Condition and Landscape Design

Currently there are no planned complex stands within this basin.

Management Opportunities

Harvest – Opportunities during this planning period include regeneration harvesting three isolated 80 acre parcels and partial cutting an isolated 150 acre parcel.

Transportation – This basin is a low priority for planning and/or investments in the infrastructure. If harvest opportunities are implemented, then road construction and improvement will be at a higher rate than the last ten years. Access across private ownership will need to be acquired.

Gales Creek Basin

The basin consists of 10,166 acres of state forest land, which is broken into 4 widely separated main blocks within the Gales Creek watershed. Much of this basin is privately owned land and has boundaries with 3 other basins of state forest land to the north, west, and south. This basin is located on the eastern edge of the district, both north and south of the Wilson River Highway, and much of this basin is easily accessible for public recreation. The Gales Creek Campground and the Gales Creek Overlook kiosk are two key recreation and interpretive opportunities located in this basin. The western portion of this basin was part of the 1933 and 1945 Tillamook fires and was one of the first reforested areas; thus, the average stand age is 60 to 65 years.

The Wildcat Mountain area, in the eastern portion of this basin, was not involved in any of the Tillamook fires. As a result, this 2,522-acre area has a wide range of stand ages from 20 to 80 years, and tree species from western redcedar and Douglas-fir to bigleaf maple and red alder. In the mid-1990s a pair of northern spotted owls was discovered nesting in this area, however, they no longer occupy this site.

Key Resource Considerations for Gales Creek Basin

- Gales Creek, a main tributary of the Tualatin River, originates in this basin. The main tributaries to Gales Creek in this basin are Beaver Creek, Iler Creek, and White Creek. Salmonids and resident trout reside in Gales Creek and most of its tributaries.
- There are approximately 12 miles of fish bearing (Type F) streams in this basin.
- Recreational considerations include Gales Creek Campground and trailhead facilities and 10 miles of non-motorized trails. This basin is designated for non-motorized recreational uses only.
- Visual resource considerations include those areas visible from the Wilson River Highway (Highway 6), particularly those areas of the forest visible from the Gales Creek Overlook, and Gales Creek Campground.
- The southeastern portion of the basin is home to two northern spotted owl sites.
- The transportation system provides fair access; access to some steeper areas needs to be developed.

Desired Future Condition and Landscape Design

Approximately 71 percent of the basin will be managed to produce OFS and LYR stand structures. OFS and LYR stands have been located within the northern spotted owl sites in the southeastern portion of the basin. Another large interior habitat area will be created in the Wildcat Mountain area. A large area of LYR and OFS stands will be located along the upper reaches of Gales Creek. This will provide connectivity to adjacent basins, as well as enhance water quality protection.

Management Opportunities

Harvest – Due to the high percentage of Desired Future Condition – Complex the majority of harvest opportunities will be partial cut prescriptions. Some regeneration harvest opportunities exist on those acres not designated as DFC – Complex.

Transportation – This basin is a medium priority for planning and/or investments in the infra-structure. Road construction and improvement will be at a higher rate than the last ten years.

Larch Mountain Basin

This basin contains 13,160 acres of contiguous state-owned land, bordered by privately owned land to the north and state forest land on the other three sides. The Wilson Basin in the Tillamook District borders this basin to the west. The Wilson River and the Wilson River Highway (Highway 6) form the entire 11-mile southern boundary of this basin. Larch Mountain, Elk Mountain, Kings Mountain, Elk Creek, Idiot Creek, and Drift Creek are the dominant features and drainages. The topography varies from the steep rugged slopes and river canyons of the Kings Mountain area to moderate slopes at the middle to upper elevations on Larch Mountain. This area was burned in the 1933 and 1945 Tillamook fires. The stands in this basin range from 55 to 60 years old as a result of the Tillamook Burn reforestation projects, and have more western hemlock than most basins in the district.

Key Resource Considerations

- Recreational and visual resources include Elk Creek Campground, Kings Mountain Trailhead, 16 miles of non-motorized trails, and the areas visible from Highway 6. The Kings Mountain and Elk Mountain area is approximately 6,000 acres of very rugged terrain with high recreational and scenic value.
- There are approximately 24 miles of fish bearing (Type F) streams located in this basin.
- Important salmonid streams include: South Fork Wilson, North Fork Wilson, Devils Lake Fork, Elk Creek, Idiot Creek, and Drift Creek. Approximately 2,300 acres of the Ben Smith Creek Salmon Anchor Habitat area is located in the western portion of this basin.
- Much of the eastern portion of the basin has stands infected with *Phellinus weirii*, a fungus that causes root disease and is fatal to Douglas-fir.
- The transportation system provides inadequate access; a large part of the basin has no access developed.

Desired Future Condition and Landscape Design

The rugged terrain and the high recreation, scenic, fish and wildlife values dictate that a large percentage (55%) of this basin will be designated as OFS and LYR. OFS has been placed along Game Hog Creek which is considered to be an important stream for salmonids. LYR stands have been placed along the Wilson, Elk Creek, Idiot Creek and Drift Creek which are also important salmonid streams. LYR stands were also located on portions of

Kings Mountain, Elk Mountain and Larch Mountain. Because of the rugged terrain and low site on these areas, these complex structures will take longer to develop than in other parts of the district. For the most part, these complex forest structures will develop naturally with little or no silvicultural manipulations. Any future partial cutting in the Kings Mountain area will most likely be done with helicopters.

Management Opportunities

Harvest – There are few harvest opportunities west of Elk Creek, perhaps one regeneration harvest and one partial cut during this planning period. East of Elk Creek harvest opportunities are more plentiful due to better access. In this part of the basin regeneration harvesting will make up the majority of the harvest prescriptions.

Transportation – This basin is a low priority for planning and/or investments in the infrastructure. Road construction and improvement will be at the same rate as the last ten years.

McGregor Basin

This basin contains 10,618 acres of contiguous state forest land located directly north of the Sunset Highway. To the south the basin is bounded by state land; privately owned land borders the other three sides. Timber is between 55 and 70 years old. The dominant feature is the North Fork Wolf Creek, which is a tributary to the Nehalem River and an important salmonid stream. This area receives low recreational use except during hunting season.

During the 1990s, northern spotted owl surveys detected non-territorial single owls moving in and out of this basin. The basin represents an important connection between the northern spotted owl usage in the Jewell area and the high quality habitat being developed to the south in the Wheeler Basin. Approximately 1,600 acres along the Sunset Highway are designated as part of a northern spotted owl cluster and will be managed to develop and maintain northern spotted owl habitat over the next 30 years.

Key Resource Considerations

- There are approximately 16 miles of fish bearing (Type F) streams located in this basin.
- The North Fork of Wolf Creek and Olson Creek are both important coho salmon streams. The western edge of this basin is located within the Upper Rock Creek Salmon Anchor Habitat (SAH) area.
- Recreational resources include the one-mile Four Corners Trail and a 1.5 mile interpretive loop trail at the Sunset Wayside on Highway 26. Hunting and dispersed camping is the most prevalent recreational use of this basin.
- The stands visible from the Sunset Highway are important as a visual resource.
- While northern spotted owls have been detected passing through this area, there are no known resident owls. However, this basin may act as important dispersal habitat. Approximately 1,600 acres of a northern spotted owl cluster are in the basin.

- In this basin, there is one individual domestic water right registered with the Oregon Department of Water Resources.
- The transportation system provides good access; construction of a few spurs and some road improvement are all that are needed.

Desired Future Condition and Landscape Design

Approximately 39 percent of this basin will be managed to produce OFS and LYR stand structures. OFS and some LYR stands have been placed within the northern spotted owl cluster. OFS stands will be concentrated along Bear Creek and the South Fork of Rock Creek within the Upper Rock Creek SAH. Additional LYR stands will be located along the North Fork of Wolf Creek and within certain older stands or stands with known high levels of down wood that are located between the cluster and the northern boundary of the forest for connectivity.

Management Opportunities

Harvest – Harvest opportunities in this basin are moderate to high. Many of the stands suited to partial cut prescriptions have been recently completed. The majority of harvest opportunities during this planning period will be regeneration harvests.

Transportation – This basin is a low priority for planning and/or investments in the infrastructure. Road construction and improvement will be at the same rate as the last ten years.

Rogers Basin

With 20,834 acres of contiguous state forest land, this basin represents the district's largest management basin. The majority of the Wilson River headwaters are included within this basin. The basin is made up of 50 to 60-year-old stands resulting from the reforestation after the Tillamook fires. This is the district's most heavily used basin for recreation; it is used primarily by off-highway vehicle (OHV) users. The basin has about 50 miles of OHV trails, an OHV campground (Browns Camp), Stagecoach Horse Camp, and 10.5 miles of non-motorized trails. Approximately 85% of this basin has been classified as Focused Stewardship-Recreation. This basin is bounded by privately owned land to the south and east, state forest land to the west, and state forest land across Highway 6 to the north. The Wilson Basin in the Tillamook District borders this basin to the west.

Key Resource Considerations

- This basin has the highest recreational use in the district, with OHV use being primary. There is an extensive trail network throughout the basin, which includes approximately 59 miles of designated OHV trails and 10.5 miles of designated non-motorized trails. Dispersed camping and hunting are also important uses.
- Browns Camp Campground, Stagecoach Horse Camp, Lyda Camp staging area, University Falls Trailhead, Rogers Camp Trailhead, and Deyoe Creek Trailhead are located within this basin.
- A major visual resource is the area visible from the Wilson River Highway, which forms the basin's northern boundary.

- There are approximately 37 miles of fish bearing (Type F) streams located in this basin.
- There are four important salmonid streams: Devils Lake Fork, Elliot Creek, Deyoe Creek, and South Fork of the Wilson. Approximately 6,000 acres of the Devils Lake Fork Wilson River Salmon Anchor Habitat area is located in the eastern portion of this basin.
- Much of the basin has stands infected with *Phellinus weirii*, a fungus that causes root rot and is fatal to Douglas-fir.
- A state-listed endangered plant, Nelson's checker-mallow, *Sidalcea nelsoniana*, is located in two small meadows adjacent to the upper Devils Lake Fork of the Wilson River.
- In this basin, there are two individual domestic water rights that are registered with the Oregon Department of Water Resources.
- The transportation system provides good access; construction of a few spurs and some road improvement are all that are needed.

Desired Future Condition and Landscape Design

For fish and scenic resources, 22 percent of the basin will be managed for complex stand structures. LYR and OFS stands will be located along the salmonid streams within the Devils Lake Fork Wilson River SAH. OFS stands will be located near the upper reaches of the South Fork of the Wilson, another important salmonid stream. Additional complex stands will be designated along a portion of the Wilson River Highway for scenic reasons.

Management Opportunities

Harvest – Harvest opportunities are moderate to high. Much of this basin is known for its high levels of root rot infection. These diseased forest stands are best treated by regeneration harvesting the highly susceptible Douglas-fir and replanting with resistant tree species. Partial cuts will be planned for healthy stands.

Transportation – This basin is a medium priority for planning and/or investments in the infra-structure. Road construction and improvement will be at the same rate as the last ten years.

Scoggins Creek Basin

This small, 3,018-acre isolated basin drains directly into Hagg Lake by means of Scoggins Creek. The Scoggins Creek canyon is predominantly characterized by steep slopes, highly erosive soils, and high risk sites. As shown during the February 1996 storm, large slide features can become active under the right weather conditions. Hagg Lake provides water for irrigation and municipal uses, and is heavily used for recreation. The state forest land within this basin is completely surrounded by privately owned land. The predominant adjacent landowner is Stimson Lumber Company, and all the state parcels within this basin are a high priority for exchange.

Key Resource Considerations

- Approximately 249 acres adjacent to the City of Forest Grove's watershed has been designated as Focused Stewardship – Domestic Water Use.
- Scoggins Creek flows directly into Hagg Lake and provides water for irrigation, recreation, and municipal use.
- There are approximately 5 miles of fish bearing (Type F) streams in this basin.
- State forest parcels are excellent candidates for exchange with Stimson Lumber Company.
- The transportation system provides limited access; access to some areas is good but some large areas need access developed.

Desired Future Condition and Landscape Design

Approximately 20 percent of the basin will be managed for OFS and LYR stand structures. Complex stands will be managed within certain older stands and within stands adjacent to streams.

Management Opportunities

Harvest – The majority of harvest opportunities remaining in this basin are regeneration harvests. Harvest activity will be moderate during the planning period.

Transportation – This basin is a medium priority for planning and/or investments in the infra-structure. Road construction and improvement will be at the same rate as the last ten years.

Sunday Creek Basin

The southernmost contiguous ownership in the district, Sunday Creek Basin, totals 15,239 acres. The vast majority of the stands in this basin are between 45 and 55 years old, as a result of reforestation after the Tillamook fires. This basin is bounded by privately owned land to the north and east, BLM and private land to the south, and by the Trask Basin in the Tillamook District to the west. Key features include the headwaters of the Tualatin River, Middle Fork of the North Fork Trask River, the North Fork of the North Fork Trask River, and Barney Reservoir (the municipal water supply for much of Washington County). Except for a small area in the southwest corner of this basin, the recreational use in this basin is designated as non-motorized and is low to moderate in frequency. The main recreational uses in this basin are hunting, fishing and dispersed camping.

Key Resource Considerations

- Important water resources include: Barney Reservoir (the general municipal watershed for the cities of Hillsboro, Beaverton, and Forest Grove) and the headwaters of the Tualatin River, which include Sunday Creek and Maple Creek. Approximately 1,470 acres around Barney Reservoir have been designated as Focused Stewardship – Domestic Water Use.
- There are approximately 21 miles of fish bearing (Type F) streams in this basin.
- The Middle Fork of the North Fork Trask River and the North Fork of the North Fork Trask River are important salmonid habitat resources. The southwest tip of this basin is located within the Elkhorn Creek Salmon Anchor Habitat area.
- Approximately 1.5 miles of OHV trail exists in the southwest corner of the basin that provides connections to established trails on the Tillamook district as well as on adjacent landowners.
- The transportation system provides good access; construction of a few spurs and some road improvement are all that are needed.

Desired Future Condition and Landscape Design

Approximately 21 percent of this basin will be managed for OFS and LYR stand structures. Complex stand structures will provide increased protection to most of the headwaters of the Tualatin River which includes Sunday Creek and Maple Creek. OFS stands will be located along Elkhorn Creek within the Elkhorn Creek SAH. Complex stands will be placed in adjacent stands along the North Fork of the North Fork Trask River to provide habitat along this important salmonid stream. Another block of complex stands will be located adjacent to neighboring BLM lands that are currently designated as Late Successional Reserves (LSR).

Management Opportunities

Harvest – Opportunities for both partial cut and regeneration harvests are moderate. Very little regeneration harvest activity has taken place during the past ten years. This can be expected to increase. For the most part regeneration harvests will be located on upland areas a good distance from the main streams in this basin.

Transportation – This basin is a high priority for planning and/or investments in the infrastructure. Road construction and improvement will be at a higher rate than the last ten years.

Upper Salmonberry Basin

This 18,955-acre basin is dominated by important salmonid streams, steep terrain, remote recreational opportunities, and scenic views. It will be targeted for a high percentage of OFS and LYR stands. This design will allow for large interior habitat areas and maximum protection of the inner canyon zones of the Salmonberry River and the North Fork Salmonberry River. While much of the basin was railroad logged, portions were burned in

large fires in 1932 and 1945. Stand ages range from 55 to 70 years, resulting from natural regeneration and planting following logging and fires. This basin is bordered by privately owned land to the north and south, and by state forest land to the east and west. The Cronin Creek Basin and the Salmonberry Basin in the Tillamook District border this basin to the west. The Port of Tillamook Bay railroad divides the basin nearly in half, paralleling the Salmonberry River. This basin is zoned for non-motorized recreation.

Key Resource Considerations

- There are approximately 36 miles of fish bearing (Type F) streams in this basin.
- The North Fork Salmonberry River has an important native steelhead population.
- The Salmonberry River, Wolf Creek, and Pennoyer Creek are other important salmonid streams. The southwest corner of this basin is located within the South Fork Salmonberry River Salmon Anchor Habitat area.
- This basin is often utilized for dispersed camping and remote recreational experiences. Hunting and viewing migrating fish in the North Fork Salmonberry River are other popular activities.
- The scenic quality of the Salmonberry River canyon is an important resource.
- There is a resident single northern spotted owl site located within the basin.
- The transportation system provides limited access; access to some areas is good but some large areas need access developed.

Desired Future Condition and Landscape Design

Approximately 49 percent of the basin will be managed for complex stands. A large portion of the South Fork Salmonberry River SAH will be designated with a mixture of OFS and LYR stands. Other LYR and OFS stands will be located within stands with high levels of down wood and snags, within stream adjacent stands and within stands that provide connectivity to upland habitats.

Management Opportunities

Harvest – Opportunities for both partial cut and regeneration harvest are moderate. It is anticipated that there will be slightly higher levels of regeneration harvesting during this planning period than over the past 10 years. For the most part regeneration harvests will be located in the upland areas.

Transportation – This basin is a high priority for planning and/or investments in the infrastructure. Road construction and improvement will be at a higher rate than the last ten years.

Wheeler Basin

This basin is bordered by private land to the east and state land on the other three sides. Stand ages are predominantly 65 to 75 years old as a result of natural regeneration following railroad logging in the 1930s.

Several key coho streams are located in this 16,141-acre basin. They include the Nehalem River, Carlson Creek, Wolf Creek, Lousignont Creek, and North Lousignont Creek. These streams are located in the eastern two-thirds of the basin. Dominating the north half of this basin is a 6,000 acre northern spotted owl cluster where the focus will be on the development and maintenance of spotted owl habitat over the next 30 years.

This basin is popular for hunting, driving and dispersed camping. It is becoming increasingly popular for non-motorized trail users, particularly equestrian users. It is zoned for non-motorized recreation. Approximately three (3) miles of the Gales Creek Trail from Bell Camp Road to Reehers Camp is located within the basin.

Key Resource Considerations

- This basin contains 6,000 acres of a northern spotted owl cluster.
- There are approximately 33 miles of fish bearing (Type F) streams in this basin.
- Important coho streams include: Lousignont Creek, North Lousignont Creek, Wolf Creek, Carlson Creek, the upper Nehalem River, and the South Fork of Rock Creek. Nearly all of this basin is within the Lousignont Salmon Anchor Habitat area.
- Recreational resources include Reehers Camp campground and three (3) miles of the Gales Creek Trail.
- The surveyed route of the Salem to Astoria Military Road runs through this basin. It has recently been identified and marked. These markers will be preserved during any operations.
- The town of Timber obtains its drinking water from the Nehalem River at a location adjacent to this basin. A 1,923-acre area upstream from this water source has been designated as Focused Stewardship – Domestic Water Use.
- The transportation system provides fair access; access to some steeper areas needs to be developed.

Desired Future Condition and Landscape Design

Approximately 56 percent of this basin will be managed for complex stands. With numerous coho streams and the spotted owl cluster in this basin, the focus will be on developing OFS and LYR stand structures quickly. All of the cluster is on a pathway to OFS or LYR. OFS stands are also located within the Lousignont and the Upper Rock Creek SAHs.

Management Opportunities

Harvest – Opportunities for both partial cut and regeneration harvest are moderate. Partial cut opportunities will be greatest within the owl cluster while regeneration harvest opportunities will be located outside the owl cluster.

Transportation – This basin is a medium priority for planning and/or investments in the infra-structure. Road construction and improvement will be at a higher rate than the last ten years.

Wilark Basin

Located in Columbia County in the northeast part of the district, these 4,596 acres of state forest land are entirely surrounded by privately owned land. A 240-acre parcel owned by Columbia County, known as Camp Wilkerson, lies at the center of the state forest land. Because of deed restrictions, the county parcel will be maintained as mature forest structure. Therefore, some LYR stand structure will be located adjacent to this parcel to increase the interior habitat area. Oak Ranch Creek and the Little Clatskanie River are the only fish-bearing streams in this basin and are not designated as core salmonid areas. Approximately 60 percent of the basin has been regeneration harvested within the past 25 years, leaving few opportunities to achieve mature forest structures in the next four decades. The terrain is very gentle, the timber is easily accessible with little or no road building, and there are few recreation or scenic opportunities.

Key Resource Considerations

- State forest land surrounds the 240-acres of county-owned land, which is being managed for complex stand structures. This provides one of the few opportunities in this basin for a large interior habitat area.
- There are approximately 7 miles of fish bearing (Type F) streams in this basin.
- Oak Ranch Creek and Little Clatskanie River are the only major fish streams.
- In this basin, there is one individual domestic water right registered with the Oregon Department of Water Resources.
- The transportation system provides good access; construction of a few spurs and some road improvement are all that are needed.

Desired Future Condition and Landscape Design

Approximately 15 percent of this basin will be managed for LYR stand structure. Complex stands will be placed along the county-owned land to create a larger interior habitat area. Other LYR stands will be located within certain older stands or stands with a known high level of snags and down wood.

Management Opportunities

Harvest – Opportunities for regeneration harvest are low. Opportunities for partial cuts are low to moderate. This basin has been well managed over the past 30 years and has a high

percentage of plantations nearing maturity. Much of the partial cuts will take place in these stands during the second half of this planning period.

Transportation – This basin is a low priority for planning and/or investments in the infrastructure. Road construction and improvement will be at the same rate as the last ten years.

Expected Outputs and Habitat Achievements

In general, structure-based management intervals used in this district have been determined to fit an 18-year average. Within any given 18-year period, a stand will be subject to review for a management prescription. If a silvicultural treatment is determined to be necessary or beneficial, the stand will be managed to either advance it toward the next level of structural complexity or to convert it into a new, young, vigorous stand, depending on the desired landscape goals for the stand. For the 10-year planning period, stands currently in OFS will be retained to function as complex structure on the landscape. In the future, when replacement stands achieve a similar structure, some of the older complex structures may be targeted for final harvest. In a few cases during the 10-year planning period, LYR stands may be regeneration harvested and reforested when the size and location of these stands are such that it is neither reasonable nor effective to manage them for complex forest structures.

Partial cutting will be the primary silvicultural stand management activity to advance stands toward the next level of structural complexity. More complex structures will not be achieved immediately following a partial cut. Historical evidence suggests that it may take the full 18-year period following the management prescription for a more complex structure to be achieved. Partial cutting in both younger and older stands will progress CSC and UDS stand structures toward the more complex LYR stand structure. Some younger stands will receive multiple partial cut entries on an 18-year interval to develop the components of a LYR stand. Some LYR stands may require an additional partial cut entry to hasten the development of OFS characteristics (larger diameter trees, higher snag densities, and greater down wood levels, etc.).

Structure Targets, Timber and Habitat

The harvest levels proposed in this implementation plan will contribute toward the desired future structure targets as outlined in Table 9, **Information Summary for all Management Basins**. Table 10 shows an estimate of desired future structure targets at the end of this implementation planning period.

Partial cuts will be evaluated during the planning process for opportunities to add structural components where they are lacking. Some snags may need to be created in older partial cuts that are lacking in hard snags. Structural components in younger partial cuts will be addressed at the next silvicultural decision point. This delay in snag creation in younger partial cuts will provide for the creation of larger diameter snags in the future. While there is no specific down wood target for partial cuts, it is felt that the recruitment of down wood should be somewhat continuous for those stands progressing towards complex stand structures. An estimated 200 cubic feet per acre of down wood will be added during partial cut operations as a result of residual slash and snag creation. In

addition, these stands will be monitored over time to ensure that recruitment of down wood is taking place through natural processes.

Within the regeneration harvest units, the snag creation level will be 2 per acre. Down wood will be added at the time of harvesting by leaving cull logs, slash, and if necessary contract requirements for creating down wood. The down wood target for regeneration harvests will be 600 to 900 cubic feet per acre in decay class 1. Where down wood is severely lacking, 1 to 2 trees per acre may be left in addition to the 5 green trees per acre target. These additional trees may be felled immediately after harvest or left standing for the purpose of recruitment by natural means over time (e.g., windthrow).

Table 10. Anticipated Stand Structure Development by 2019

	REG	CSC ²	UDS ³	LYR ⁴	OFS
Current Condition	4	15	63	15	0
After Implementation Plan Period ¹	8	10	58	20	1
Desired Future Condition	←———— 57 —————→			20	20

1. These are estimates that may differ from the actual conditions significantly.
2. After partial cutting CSC stands, it takes about 5 –to 7 years for an understory to develop.
3. After partial cutting and/or underplanting, it may take 20 to 30 years for layering to develop.
4. The time it takes to develop LYR stands into OFS is highly variable and depends on many factors, including (but not limited to): snag and down wood recruitment; development of trees greater than 32 inches in diameter.
5. The percentage for all stand structures does not equal 100% because 3% of the district is designated as Non-Silviculturally Capable or Non-Forest.

Harvest Outputs

The Annual Harvest Objects (AHO) in Table 11 identifies the sustainable and predictable production of timber (forest products) from the district, and the harvest activities “for the ten-year period that will be necessary to move toward the desired future condition” (NW FMP page 5-4). The AHO is determined through the District Opportunity Analysis described in Appendix A. The Opportunity Analysis establishes 58 MMBF as the maximum sustainable volume that can be produced to meet the goals of the Northwest Oregon State Forest Management Plan as applied through this Implementation Plan. The acre ranges for regeneration harvest and partial cut harvest describe the types of harvest activities that will occur over time to achieve the volume objective and desired future condition of stand structures.

The AHOs will be implemented through the district’s Annual Operations Plan. The objective is to achieve the average of the AHO over the expected 10 year planning horizon for the Implementation Plan. Under normal circumstances, the volume proposed in an Annual Operations Plan will be near the AHO target; however, unforeseen, events may result in an Annual Operations Plan volume that is farther from the AHO target. Unforeseen events may consist of, but are not limited to, catastrophic windstorm, fire, or poor market conditions. For example, catastrophic events may that lead to emergency

salvage operations that result in harvesting above of the AHO, or poor market conditions preclude meeting AHO volume. When unforeseen factors for one district preclude achieving AHO objectives, the State Forester may re-direct annual harvest levels to another district. The Annual Operations Plan will describe how the volume relates to the AHO volume identified in the Implementation Plan.

The acres of regeneration harvesting and partial cutting proposed in each Annual Operations Plan will normally be within the ranges identified in Table 11, but the mixture of acres will vary from year to year based on the stands selected for harvest, their current condition, desired future condition, and the silvicultural prescription used to move the stand from its current to its future condition. Numerous factors apply to the stand selection process and their relative importance may change from year to year and from basin to basin. Factors that affect the stand selection process include the overall objectives indentified in this Implementation Plan, recent harvest activity in the basin, results of threatened and endangered species surveys, condition of the transportation system, and current market conditions.

If changed conditions, new information, or different strategies indicate a significant shift in the AHO is necessary; this Implementation Plan will be revised. There are two processes for revisions to the Implementation Plan: major or minor. Page 5-4 of the Northwest Oregon State Forest Management Plan defines a major revision (of the AHO) as:

“Revisions that propose changes to the annual harvest level ranges of more than 25% (based on combined acreage of regeneration and partial harvest).”

The Northwest Oregon State Forest Management Plan prescribes a 30-day public comment period prior to State Forester approval of major revisions. Minor revisions (those that do not meet the criteria of a major revision) to the Implementation Plan may be approved by the District Forester. Minor revisions to the Implementation Plan are described in Annual Operations Plan.

Table 11. Annual Partial Cut and Regeneration Harvest Objectives, by Volume and Acres

Volume (MMBF)	Regeneration Harvest Acres	Partial Cut Harvest Acres
58	300 - 1,350	600 - 2,500

Appendix A

District Opportunity Analysis

This Implementation Plan describes the current condition of the resources present on the district, landscape design strategies to achieve a desired future condition, and management activities for a 10 year period, including the Annual Harvest Objective (AHO). This appendix describes the *Opportunity Analysis* the district used to determine the AHO to achieve the strategies described in this Implementation Plan, the Northwest Oregon State Forest Management Plan, the Draft Western Oregon Habitat Conservation Plan, and the other plans, policies or strategies listed in the *Introduction* of this Implementation Plan.

The purpose of the Opportunity Analysis is to identify the highest sustainable flow of timber volume that attains the stand structure goals for the district. The Opportunity Analysis also identifies the acreage range for regeneration harvest and partial cut harvests necessary to achieve the volume outputs and stand structure goals.

The Opportunity Analysis is based on the volume, harvest acre, and stand structure outputs from a harvest scheduling model. Those outputs have been analyzed by the district using results of recent timber harvest and other information to *ground truth* the model. In this analysis, the district accounts for factors which could not be model because of a lack of data (i.e. high landslide hazard locations), as well as factors that do not lend themselves to a computer model (i.e. scenic and recreation resources).

The district's Opportunity Analysis is the source of the AHO and other management activities listed in the following tables in the Implementation Plan:

- Table 6. Annual Silvicultural Activities for Fiscal Years 2010 to 2019
- Table 11. Annual Partial Cut and Regeneration Harvest Objectives, by Volume and Acres

Harvest Scheduling Model

The harvest scheduling model that generated the data for the Opportunity Analysis is based on the models used for the Harvest and Habitat Model Project. These models are designed to simultaneously achieve goals for timber harvest and stand structure development consistent with the principles of structure based management described in the Northwest Oregon State Forests Management Plan. These models are designed to incorporate rules that emulate the strategies and practices contained in plans, policies, and strategies that apply to the planning area. More information on these models can be found in the *Harvest and Habitat Model Project Final Report* (ODF; March 8, 2006) or by contacting the State Forests Operations Coordinator in Salem.

The harvest scheduling model for this Opportunity Analysis has been updated from the Harvest and Habitat Model to:

- Ensure the model rules reflect the plans, policies, and strategies that are applicable to this Implementation Plan, as described in the *Introduction* section of the Implementation Plan;
- Incorporate the most current spatial data available, including stand boundaries, locations of species of concern, and the current landscape design; and
- Revised yield tables developed from most current Stand Level Inventory data.

Harvest Context

- The average AOP volume per year over the last five years is approximately 12% higher than the current Implementation Plan volume mid-point for two main reasons. First, the State Forester directed the district to prepare the 2005 and 2006 AOP’s at the high end of the volume range (67.4 MMBF). Second, the district was directed to prepare the 2007, 2008, and 2009 AOP’s based on a new model run which included a departure from a non-declining even flow of volume resulting in an AHO of 62.5 MMBF. The district believes that the new model volume output (58 MMBF) per year can be implemented given the acreage ranges displayed in Table A-1.

Table A-1. Harvest Outputs

	Model Outputs ¹	AOP Average 2005 through 2009	Implementation Plan ²
Volume (MMBF)	58	64	58
Regeneration Harvest Acres	893	693	825 300 - 1,350
Partial Cut Harvest Acres	1,503	2,645	1,550 600 - 2,500
Total Acres	2,398	3,339	2,375 900 – 3,850

1. Average annual harvest level based on the average outputs from the first two periods of the IP Revision Harvest Model (H&H 7).

2. Annual harvest levels from the implementation plan March 2009. The top number is the mid-point of the range and the lower numbers are the range of outputs.

- The average harvest volumes per acre shown in Table A-2 make sense to the district. Actual Partial Cut volumes per acre over the past five AOP’s (18.0 MBF) almost match up exactly with the model volume per acre (18.4 MBF). Actual Regeneration Harvest volumes per acre can easily fluctuate plus or minus 10 percent based on the stands selected for any given AOP. While Partial Cut “Take” volumes per acre don’t vary all that much from stand to stand, Regeneration Harvest volumes per acre can vary by as much as 40 percent. Therefore, a difference of 10 percent is not a concern to the district.

Table A-2. Average Harvest per Acres

	Model ¹	Actual ²	Difference	Percent
Regeneration Harvest	34.8	38.4	3.6	10.3
Partial Cut Harvest	18.4	18.0	0.4	2.2

1. Average volume harvest per acre for the first model period.
2. Based on the 5-year average volume harvested per acre using "cut out" or timber cruise information.

Other Factors Affecting Implementation

High Landslide Hazard Locations. This impacts a very small acreage on the district. There is no need for any volume adjustment.

Focused Stewardship – Recreation. There are approximately 19,146 acres of Focused Stewardship – Recreation subclass located primarily within the Roger’s basin south of highway 6. With Forest Grove’s proximity to the greater Portland area we experience a high level of recreational use. There is a high level of sensitivity from users related to harvest impacts on both motorized and non-motorized trails. In the past the district has tried to limit impacts by spreading out harvest units both spatially and temporally. This was not modeled because of the difficulty in quantifying these impacts. Since the model is not operational the district’s timber management unit and recreation unit can continue to work together to minimize harvest impacts on recreational use.

Northern Spotted Owl Circles. The model reflects the current NSO sites, thus there are no impacts to the implementation of the annual harvest objective.

Gap Sales. The model selected harvest units in approximately 15 sales that have been harvested or sold since January 1, 2008. Again, since that model is not operational this is not an issue.

Implementation

The Annual Harvest Objectives for the implementation plan are 58 MMBF on 883 acres of Regeneration Harvest and 1,576 acres of Partial Cut. These acreages represent the mid-point of the ranges shown in Table A-1. Annual Harvest Objective acreage ranges were set assuming a minimum of 20 percent of the AHO volume will include either partial cut or regeneration harvest. The factors mentioned above will not have any significant impact on the implementation of these objectives during the Implementation Plan period.

Appendix B

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Map Section

- 1. Forest Grove District Overview**
- 2. Forest Grove District: Current Condition Stand Structure**
- 3. Forest Grove District: Desired Future Condition Stand Structure**