West Oregon District

Implementation Plan

March 2003

This implementation plan describes the management approaches and activities that the West Oregon District will pursue in order to carry out the *Northwest Oregon State Forests Management Plan* and the proposed *Western Oregon State Forests Habitat Conservation Plan (HCP)*.

The *West Oregon District Implementation Plan (and earlier drafts)* guide forest management for all forest resources on West Oregon District from July 1, 2001 through June 30, 2011.

The main headings in this plan are listed below. A detailed table of contents begins on the next page.

District Overview 4
Management Activities 17
Landscape Design Overview 34
Management Basins 36
Expected Outputs and Habitat Achievements 51
Appendix A. Determining Levels of Harvest and Other Silvicultural Activities 55
Appendix B. References 64
Map Section 66

Table of Contents

District Overview 4
- Land Ownership 4
- Land Management Classification System 5
- Physical Elements 7
  - Geology and Soils 7
  - Topography 8
  - Water 8
  - Climate 8
- Natural Disturbance 9
- Biological Elements 9
  - Vegetation 9
  - Insects and Disease 9
  - Fish and Wildlife 10
- Human Uses 10
  - Forest Management 10
  - Roads 11
  - Recreation 13
  - Scenic 14
- Forest Stand Structure: Current Condition 15

Management Activities 17
- Current Condition Analysis 17
  - Hardwoods 18
  - Closed Single Canopy 19
  - Understory 20
  - Layered 20
  - Older Forest Structure 21
  - Non-Silviculturally Capable 21
- Management Activities in Each Stand Type 21
  - Regeneration Stands 21
  - Closed Single Canopy Stands 22
  - Understory Stands 24
  - Layered Stands 25
- Proposed Management Activities 26
  - Silvicultural Activities 26
  - Roads 26
  - Recreation 30
  - Energy and Mineral Resources 31
  - Lands and Access 31
  - Scenic Resources 32
  - Plants 32
  - Special Forest Products 33

Landscape Design Overview 34

Management Basins 36
- Management Basins Overview 36

Basin Descriptions 36
Burnt Woods Ridge 36
Green Mountain 39
Blodgett 41
Bonner Ridge 43
Scattered Coastal 45
Black Rock 47
Information Summary For All Management Basins 49
Expected Outputs and Habitat Achievements 51
FY 2001-2003 Sale Plans and Existing Sales 54
Appendix A 55
Determining Levels of Harvest and Other Silvicultural Activities for Northwest State Forests 55
Appendix B 64
References 64
Map Section 66

District Overview

Land Ownership

The West Oregon District manages 37,672 acres of state forest land in the Coast Range, generally between Corvallis and Newport. This land is located on 50 separate parcels, ranging in size from 11 acres to 11,300 acres, in Benton, Lincoln and Polk counties (see Table 6-1). The parcels are located as far south and west as Waldport, north up to Dallas, and east to Marys Peak. Overall, the district manages 59 square miles of forest land over a 1,000-square-mile area. However, about one-half of the land is located in two large blocks. The largest land parcel (11,300 acres) is located just south of Highway 20, between Burnt Woods and Eddyville; the next largest parcel (8,400 acres) is located on Green Mountain, seven miles north of Highway 20.

Table 6-1. West Oregon District Acres, by County and Ownership

County	Board of Forestry	Common School	Total Acres
Benton	8,128	713	8,841
Lincoln	15,530	5,500	21,030
Polk	6,059	1,742	7,801
Total	**29,717**	**7,955**	**37,672**

Because the district lands are widely scattered and fragmented, a very high proportion of state forest lands are near other landowners. Industrial forest land owners control more than one-half of the land adjacent to state forest land on the West Oregon District. Most of the remaining adjacent landowners have from less than 10 acres to a few hundred acres. These small landowners often have residences on their properties and their lands are frequently used for agricultural purposes, generally sheep or cattle grazing. The Siuslaw National Forest and the Alsea Resource Area of the Bureau of Land Management (BLM) are immediately to the south of the largest block of district lands (located between Highway 20 and Big Elk Creek). Although the federal forest lands border district lands at only a few locations, they do provide large, contiguous areas of older forests in close proximity to state forest lands.

Land Management Classification System

The land management classification system is a method of describing the management emphasis for parcels of state forest land. This management emphasis identifies the extent to which a parcel of land can be managed for a variety of forest resources. It indicates forest resources that require a higher level of focus in their management and those that exclude other uses altogether.

The framework of the land management classification system 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. These are applied across landscapes and over time and are designed to meet forest management planning goals.

To meet forest management goals on Focused Stewardship lands, it is necessary to carry out supplemental planning or modified management practices. This may include activities designed to comply with legal or contractual requirements. Planning and management practices on Focused Stewardship lands are more intensive than 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
3. Lands are committed to a specific use and management activities are limited to those that are compatible with the specific use.

Because there may be two or more uses identified for a single parcel of land, the subclasses will often overlap. Note that overlapping classifications result in acreage sums that are in excess of the total state Lands ownership. This results are evident in Table 6-2 and Table 6-3.

Table 6-2. West Oregon District Acres, by Stewardship Class and Fund

Classification	BOF	CSL	Total Acres
Special Stewardship	2,704	1,275	3,979
Focused Stewardship	10,766	3,307	14,073
General Stewardship	18,211	4,194	22,405

Table 6-3. West Oregon District Acres, Focused and Special Stewardship Subclasses

	Focused	Special
Administrative Sites	0	0
Aquatic and Riparian Habitat	7,522	2,574
Cultural Resources	5	1
Deeds	0	3
Domestic Water Use	3	0
Easements	72	121
Energy and Minerals	0	0
Operationally Limited	N/A	108
Plants	22	0
Recreation	114	29
Research/Monitoring	0	35
Transmission	158	50
Visual	2,734	14
Wildlife Habitat	3,443	1,044

History

During the mid to late 1800s, a series of wildfires burned through most of the forests that now comprise the State forest land on the district. Nearly all of the lands in Lincoln County, more than half of the lands in Polk County, and some of the Benton County lands were burned. Widespread homesteading began at about this same time, and continued across the Coast Range through the 1930s. Grazing and timber harvesting were the primary activities then. After the 1930s, many of the homesteads were abandoned, and the pastures and cutover lands slowly returned to forest. The abandoned homesteads were forfeited to the counties for back taxes and eventually turned over to the Board of Forestry for management.

Common School Lands were given to Oregon at the time of statehood by the federal government to facilitate the establishment of a public school system throughout the State. Originally, these lands were managed by local school superintendents, and were sold, harvested, or traded as was necessary to support the local school district. Later, Common School Lands came under the control of the State Land Board. When the Oregon Department of Forestry began to manage Common School forest land for the State Land Board, these lands, like the Board of Forestry lands, were pastures and cut-over lands that were slowly returning to forest.

The Department of Forestry began active management of these lands in the mid-1950s. Since then, management activities have included clearcuts, partial cuts, and conversion of brush fields to conifer stands. There have also been frequent salvage harvests of wind-thrown and standing dead trees. Reforestation and other young stand management activities (precommercial thinning, vegetation management, fertilization, and pruning) have also occurred. To enable the management activities, roads have been constructed and improved throughout the district to the extent that most of the lands are now easily accessible.

Physical Elements

Geology and Soils

The geology of the district is sedimentary rock, mostly sandstones and siltstones, deposited over igneous rocks of an older seamount terrain. The deposition of these sedimentary rocks began approximately 50 million years ago. The area has been uplifted and eroded to form the present landforms.

Because of the ongoing uplift and erosion, the landforms of the Oregon Coast Range are geologically young. The high precipitation levels combined with steep slopes result in high erosion rates, dominated by mass wasting. Forest landslides that result in debris slides are a dominant geologic process on this landscape.

The soils on the district range from approximately 40 to over 60 inches in depth, and are generally considered very productive. Approximately 92 percent of the acres are classified as Low Site I or High Site II (Douglas-Fir 50-Year Site Index).

Topography

The district's topography has gentle to steep slopes, with some areas having narrow ridges and deep V-shaped valleys. The lands range in elevation from a few feet above sea level to approximately 2,200 feet. The streams are actively down-cutting many of the valleys. Approximately 32 percent of the landscape has gentle to moderate slopes (slopes of less than 40 percent), while 25 percent is classified as steep (slopes of 40 to 65 percent). The remainder (43 percent) is classified as precipitous (slope of greater than 65 percent). These conditions are important factors in formulating land management decisions.

Water

The rivers on the district flow into two major drainage basins, the Northern Oregon Coastal (71 percent) and the Willamette (29 percent). The rivers that drain into the Northern Oregon Coastal Basin are the Siletz, Yaquina, and Alsea. The Luckiamute and Marys rivers flow into the Willamette Basin.

The Marys River provides drinking water to the city of Philomath, and state forest land comprises about 10 percent of the watershed upstream from the water intake. There are 5 registered domestic water rights on state forest land and 38 more domestic water rights within 1,000 feet of these lands.

The Department of Environmental Quality has listed portions of Big Elk Creek, Siletz River, Marys River, and the Luckiamute River as water quality-limited under the 303(d) rule. The specific portions and reasons are listed in the **Management Basin Description** section. The 303(d) listing process was updated in 2002, but final data is not yet available

Climate

District lands are located in the transition area between the coastal and Willamette Valley climate zones. The climate is relatively mild throughout the year, with cool, wet winters, and warm, dry summers. Over 50 percent of the rainfall occurs from December through February. The average monthly high temperature at Newport is about 65 degrees during the summer; the average monthly low temperature is about 38 degrees in the winter. In Corvallis, these temperatures are 80 and 34 degrees, respectively. Daily maximum temperatures exceed 90 degrees only about 5 to 15 days per year in the Willamette Valley, while below zero temperatures occur only once every 25 years. These temperature extremes are even less frequent closer to the coast.

Precipitation on the district is very closely related to elevation, with the lower elevations receiving about 50 inches per year, ranging up to nearly 200 inches per year at the higher elevations. The winter months have precipitation totals exceeding 10 inches per month, while the totals for summer months are frequently less than 1 inch. Very little of the precipitation falls as snow (yearly snowfall averages about 10 inches). While ice storms rarely occur, they have a high potential for causing severe damage to the forest by breaking the tops and limbs out of trees.

Generally, strong winds precede winter storms. These strong winds, with speeds sometimes equivalent to hurricanes, have the potential to cause great damage to the forest by breaking the tops and limbs out of individual trees or by blowing down large stretches of the forest.

Natural Disturbance

The majority of natural disturbances in coastal forests are wind related but the effects of wildfire, insects, and disease can also result in an impact. These disturbances can create a variety of patch sizes and conditions in the forest. Damage can occur to an individual tree like a broken top or at catastrophic levels like stand replacing fires. State forest land receives damage from wind most winters which can cause a single tree or small patches of trees to blow down or break apart. However, larger scale windthrow can occur as well. Diseases such as Swiss needle cast and insects such as the spruce tip weevil can also damage or kill trees.

Biological Elements

Vegetation

The forest canopy on the district is primarily comprised of Douglas-fir, red alder and bigleaf maple. Western hemlock is common on lands over 1,500 feet in elevation and on coastal parcels. Sitka spruce, grand fir, and western redcedar are also present, but in very low numbers. Red alder dominates stands in riparian areas and some upland sites. In the upland red alder stands, the canopy cover is mostly red alder trees mixed with a few large Douglas-fir. Lodgepole pine is present on a few of the tracts very close to the coast. The most common understory species are salal, sword fern, vine maple, and salmonberry.

Insects and Disease

Laminated root rot, a native fungal disease, is present in 5 to 10 percent of the stands through out the district. The greatest concentrations are found in the Bonner Ridge and Black Rock basins. This disease infects several conifer species, but it can be fatal to Douglas-fir and grand fir.

Swiss needle cast (SNC) is a native fungal disease of Douglas-fir that had historically caused little damage. In the mid-1980s, the disease began to spread and become more severe in its effect. This disease, which causes the premature shedding of needles, has resulted in severe growth reductions in some stands, particularly plantations between 10 and 30 years old. In addition to the growth loss, there is concern that this disease will limit the development of complex forest structures in severely infected stands. Currently, less than 10 percent of the stands on the district are infected with SNC. Many of these stands are moderately or severely infected. Generally, Douglas-fir trees with 2 to 3 years of needle retention are considered moderately infected while trees with less than 2 years of needle retention are considered severely infected.

The Board of Forestry provided the department with specific guidance on the management of stands that are severely infected with Swiss needle cast in the Board Intent Statement number 6, which states:

> The District Implementation Plan will reflect the principles and assumptions contained in OSU model run IC-2 and will aggressively treat Swiss needle cast (SNC) consistent with the SNC Strategic Plan.

The Swiss Needle Cast Cooperative (SNC Cooperative) is actively studying management strategies and implications for SNC. The cooperative is comprised of State, Federal, private and academic partners to fund and implement studies of SNC in the Coast Range. These studies vary from growth analysis in plantations, to retrospective and manipulative studies in commercial thinning to aerial surveys. Some of these studies are being sponsored and completed by SNC Cooperative, ODF or university graduate work. These studies are being shared with all landowners to assist in combating the impacts of SNC on forest management and are available in annual reports from SNC Cooperative.

Fish and Wildlife

There is a wide variety of wildlife present in the Coast Range and on the district. Some of the most common species are black-tailed deer (30 to 40 per square mile), Roosevelt elk (average 4 per square mile), and black bear (average 2½ per square mile). Also common are beavers, mountain beavers, cougars, bobcats, and coyotes.

Portions of the district have been surveyed regularly for northern spotted owls since 1990 and for marbled murrelets since 1992. One male northern spotted owl has been detected that currently resides part-time on state forest lands. There are 9 areas on the district that have had significant marbled murrelet activity, generally located in the northern portion of the district between Siletz and Little Grass Mountain. No other threatened or endangered terrestrial species are known to exist on or around state forest land.

Various streams in the Northern Oregon Coastal Basin have been deemed important to certain species of fish, including coho salmon (a threatened species), chinook salmon, steelhead trout (a candidate for listing), cutthroat trout, and Pacific lamprey eel. Cutthroat trout are found throughout the Willamette Basin and steelhead trout (a threatened species) occur in the Luckiamute River system. The individual streams within these basins are listed under the **Current Condition** subsections within the Management Basins section of this document.

Human Uses

Forest Management

In 1992 the district prepared and sold a total of 528 acres for clearcut harvest. Since then, new regulations for threatened and endangered species and a shift in management emphasis resulted in fewer acres available for clearcut harvest. In each year of 1993 and

1994, about 60 acres of clearcut harvest were sold. From 1995 to 1998, the district's annual harvest included about 300 acres of clearcut harvest and approximately 600 acres of partial cut harvest. During the first two years of its *1998 Interim Implementation Plan,* the district sold about 130 acres of clearcut and 900 acres of partial cut harvest per year.

Other stand management activities since 1992 include (approximate yearly averages): 300 acres of planting; 1,000 acres of vegetation management; and 500 acres of precommercial thinning. A limited amount of fertilization and pruning have occurred.

Roads

The West Oregon District's primary road network is an established system that has been in place for fifteen to twenty years. It provides access for forest management activities, fire suppression, and public travel. The mainline road system is relatively complete. Many of the high-use roads were originally built as low-use standard roads accessing homesteads and timberlands. Over the past thirty years, many of these roads have been upgraded and now have improved width, alignment features, rock surfacing, and drainage structures that provide for water management and fish passage. This road system will be maintained and expanded over time as necessary.

In general, the district road network can be divided into the following management categories:

Active Use — This category includes roads that are open for public travel using any motorized vehicle. It includes permanent roads and temporary roads that are currently in use or will be used in the near future. These roads are usually available for continuous or intermittent use at any time of the year. Roads in this category require active maintenance and have a full maintenance obligation under the Oregon Forest Practices Act.

Restricted Access Road — This group includes the following categories of roads closed to vehicle use. The first two retain the obligation for maintenance under the Oregon Forest Practices Act.

- Closed Road — There is restricted access to the road for part or all of the year. This may be as simple as placing a sign or other marker at the start of the road, as might be the case in a cooperative travel management area for wildlife protection. Or, it might involve placing a semi-permanent barricade at the start of the road. This barricade can be a gate, large boulders, stumps and logs, or a trench. Blocking a road does not significantly alter its nature or eliminate our obligation to maintain it. However, elimination of traffic-related wear reduces both road maintenance costs and road related sediment loads.
- Partially Vacated Road — Partial vacation involves barricading the road and installing minor drainage structures such as water bars or rolling dips. This strategy is best suited to roads that will be needed again after long periods (perhaps as much as 15 to 20 years) of inactivity. Ridge-top roads or other roads where drainage and sediment issues are negligible are good candidates. The nature of the road may be altered somewhat through the addition of waterbars and other drainage structures. Although there is a

viable obligation to maintain partially vacated roads they require less maintenance and do not produce significant amounts of sediment.

- Fully Vacated Road — Full vacation involves removing all stream crossing structures, installing maintenance-free drainage (outsloping, water bars, rolling dips, etc.), pulling back any sidecast material, seeding grass on disturbed soil, and barricading the road. The road is effectively "put to bed." All access is prevented, and there is no maintenance obligation. Cross-drain culverts may be left in place but will not be considered as a functional drainage feature.
- Abandoned road — These roads are no longer used or maintained but have not been formally vacated to today's Forest Practices standards. These roads are generally unavailable for use because of encroaching vegetation or road failures that prevent passage of vehicles.

The Partially and Fully Vacated Roads are categorized as "Managed Access". These roads are short or collector spurs and are closed to reduce or minimize vandalism, dumping, operational conflicts, wildlife harassment (cooperative travel management areas), road wear, and water quality impacts. All Managed Access roads are open to public non-motorized travel (hiking, biking, horse riding) with the exception of areas in active operations.

The Active and Restricted Access Roads have been classified into three separate road use standards as defined in the *Forest Roads Manual* (ODF, July 2000). These standards provide guidance on how roads are constructed, improved, and maintained.

Low Use Standard — These are individual short spur roads designed primarily for pickups and log trucks. Low use roads generally provide access to a single harvest unit. Their use is short term and may be temporary.

Medium Use Standard — These are longer spur roads designed primarily for pickups and log trucks. Medium use roads may provide access to several harvest units. Their use is more permanent.

High Use Standard — These are longer roads designed for all types of traffic, including large equipment. They are generally permanent, designed for all weather use, and provide access to large areas. They are often referred to as mainline roads.

Road Inventory

- The last comprehensive inventory of the district's road system was conducted in 1999.

Information on current condition was gathered on about 89 percent of the district's roads. The information was used to help identify areas of concern, prioritize needed repairs, and plan road management activities. The following information is of interest:

- Eighty two percent of the inventoried road miles are active, and the remaining 18 percent are restricted or fully vacated.
- Approximately 60 percent of the road miles are located on midslopes, 30 percent on ridge tops, and 10 percent in valley bottoms.

- Over 82 percent of the road miles are surfaced with gravel. The remaining roads are unsurfaced and nearly all of those have been partially vacated.
- The road surface is shaped for good drainage on 97 percent of the road miles. Some rutting and erosion are occurring on the remaining roads.
- Cut slopes are rated as good on nearly 90 percent of the road miles. Cut slope ravel is the major problem on the remaining road miles.
- Only 2 areas of potential road fill instability have been identified.
- Ditchlines are rated as good on 87 percent of the road miles and less than 1 percent were showing signs of cutting or were filled with sediment.
- The 12 percent of roads that are located on ridge tops or are outsloped for drainage and do not require other drainage structures such as ditches, catch basins or culverts.
- There are nearly 850 culverts installed across roads in the district and over 80 percent are in good condition. The deterioration of the remaining culverts is due to sedimentation or mechanical damage.
- Opportunities for reducing road related sediment delivery to streams by improving the number and location of culverts have been identified in about 40 locations.
- Twenty-seven culverts are installed in known fish-bearing streams. Of these culverts, 33 percent will allow upstream and downstream movement for all fish species. The remaining culverts partially or fully impede fish passage (the district is consulting with Oregon Department of Fish and Wildlife fish biologists to prioritize these culverts for fish passage improvement projects).

The district maintains approximately 262 miles of single-lane roads with turnouts on state forest lands. There are about 3 miles of paved roads on state forest land that are maintained by either the Oregon Department of Transportation or one of the counties.

Table 6-4. West Oregon District Road System

Road Use Standards	Miles
Low Use	99
Medium Use	112
High Use	51
Total Miles	262

Recreation

It is recognized that recreation activities provide economic value to the local community and the region. Current recreation activities on the district consist mostly of dispersed camping, sightseeing, hiking, hunting, and fishing. However, there are four sites that do receive some level of consistent visitor use during certain periods of the year.

Big Elk Creek Campsite is located in the Burnt Woods Basin and has three undeveloped camp sites along the stream that are used primarily during the summer months. Surfaced roads access two of the sites. The remaining campsite is accessed by an unsurfaced road, which is currently blocked to vehicle traffic. The two campsites that are accessed by all-weather roads can be utilized year round. These campsites are occupied most weekends from June through August.

Baber Meadows is located in the Burnt Woods Basin adjacent to Bear Creek. District personnel have worked closely with Mt. Baber ATV club members to develop the meadow for an off-highway vehicle staging area. Access roads and parking areas have been recently surfaced. A restroom has been installed and overnight camp sites are in the process of being developed. Camping takes place primarily during the summer months and hunting season in the fall. The meadow functions as a staging area for ATV riders and is the beginning and eventual ending point of a loop trail system. The Department of Forestry will continue working with the Mt. Baber ATV Club to further develop the recreation potential of this site.

Yaquina Falls is located in the Green Mountain Basin and is a series of natural waterfalls, two of which are on state forest land. Recreation use for the falls is primarily hiking and sightseeing, but includes fishing as well. There is no developed trail system that adequately accesses the falls, and only one of the falls, which is on private land, is an easy hike from an existing surfaced road. Visitor use is year round, but mostly concentrated during the summer months.

Black Rock is a parcel of land that is used for a number of recreational activities and is located in the Black Rock Basin. Camp Tapawingo is a church camp adjacent to Black Rock, and camp visitors use existing roads and trails on state forest land for hiking and horseback riding. There is increasing use of the area by mountain bike riders that come mostly from the Salem area. District personnel are working with the recently formed bike riding club, the Black Rock Free Ride Association, to develop a well maintained and increasing trail system.

Scenic

Highway 20, designated as a scenic highway by the Forest Practices Act, is considered one of the main travel corridors between the Willamette Valley and the Oregon coast. This highway runs through the middle of the district. However, only a small portion of state forest lands are visible from this highway.

Portions of state forest land is also adjacent to a number of rural residences and the county roads that access them. About 2 percent of the state forest land is in close proximity to these areas.

Much of state forest land is visible from the U.S. Forest Service recreation site on Marys Peak. State forest lands viewed from Marys Peak are south and east-facing slopes, seen at a distance of about 5 to 20 miles. From Highway 20, the rural residences, and Marys Peak, the visible state forest lands are adjacent to and intermixed with those of many other landowners.

Forest Stand Structure: Current Condition

In order to determine the current condition of the stand structure array on the district, the OSCUR stand inventory was screened, and results were verified with aerial photos and field work. The OSCUR inventory was developed in the late 1970s and early 1980s, primarily to track the growth and yield of forest stand types for timber production. This inventory contains a variety of data useful in predicting current stand structure, including: tree species composition, stand age, stand density, and stand management history. However, OSCUR has a limited ability to indicate the stand structures with complete accuracy (e.g., understory species composition, nonmerchantable tree species, layering, etc.).

The stand types first produced through OSCUR queries were compared with field observations. Even after several versions of the queries, about one-fifth of the stand types still had to be revised manually through field observations, local knowledge, and aerial photo interpretation.

Since not all stands were field checked, it is likely that the current condition indicated on the map is not completely accurate. Therefore, all silvicultural prescriptions will be based on field verification of the current stand structure classification. A new Stand Level Inventory is currently under development and will include the additional information necessary to accurately assess stand structure.

The current condition stand structure percentages shown in Figure 6-1 do not include clearcut and partial cut harvests that are currently under contract (but where timber has not been felled), nor do they reflect harvest and other management activities in the 2001 through 2003 annual operations plans.

Figure 6-2 displays the age class distribution (in 20-year intervals) of all stands on the district. Both figures show that the district is dominated by younger stands.

Abbreviations for Forest Stand Structure Types

REG	Regeneration
CSC	Closed Single Canopy
UDS	Understory
LYR	Layered
OFS	Older Forest Structure
NSC	Non-Silviculturally Capable

Figure 6-1. Current Stand Structure, by Acres and Percent

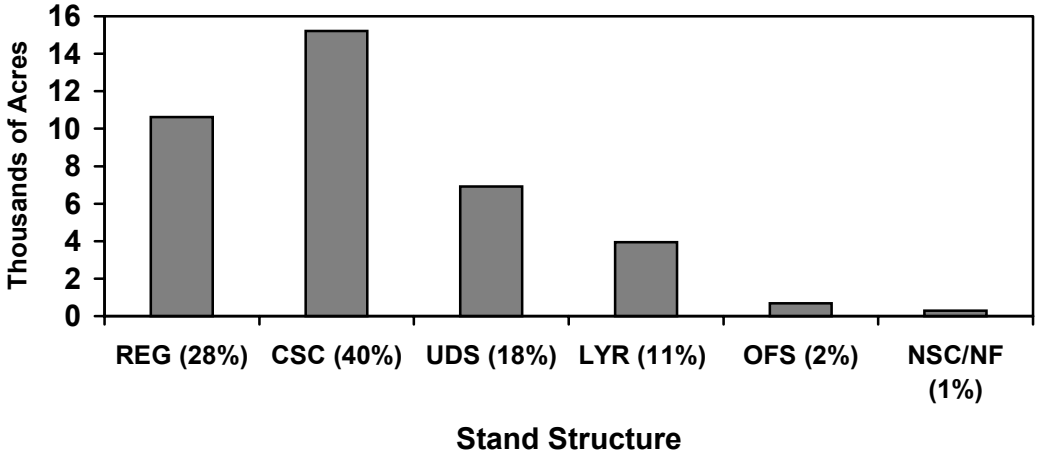
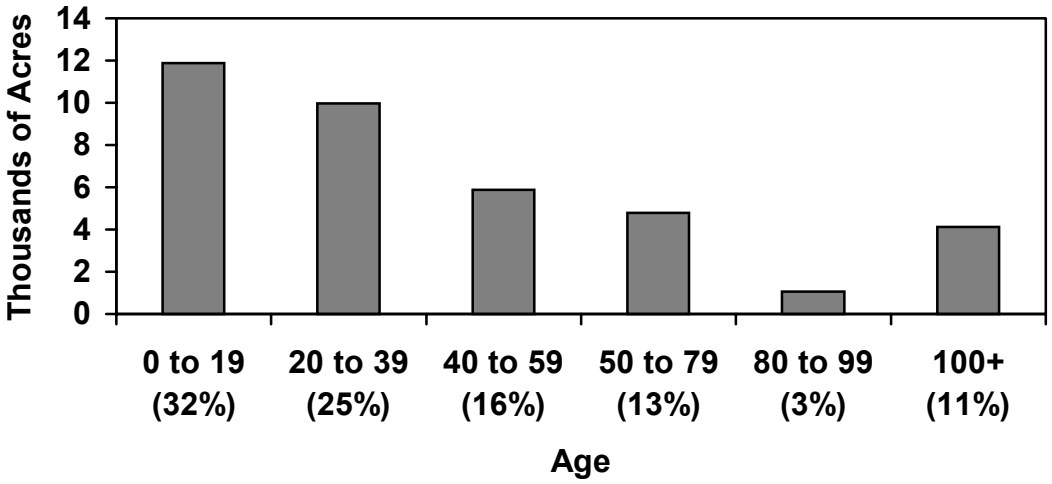


Figure 6-2. Stand Age Distribution, by Acres and Percent



Management Activities

Current Condition Analysis

The district is dominated by young regeneration and closed single canopy stands, as seen in Figures 6-1 and 6-2. Over 70 percent of the stands on the district are less than 60 years old, and nearly 70 percent are in the regeneration and closed single canopy stand types. Approximately 30 percent of the stands are in the understory, layered and older forest structure types (less than the amounts in the district's desired future condition). In order to meet the district's stand structure goals, the younger stands must be placed on a pathway that will move them toward the more complex structures.

Stand Structure 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.

Hardwoods

Although hardwood stands are not a stand structure type, as defined in the *Northwest Oregon State Forests Management Plan*, they do play an important role in the mix of stand structures across the landscape. Hardwoods on the West Oregon District are found as nearly pure stands (up to 40 or 50 acres); as a major component in conifer stands; as small patches within conifer stands; as the dominant species in riparian areas; or as a second canopy in some conifer stands. Although hardwood trees occur in a wide variety of stand types, densities, and compositions, a hardwood stand is defined (for the purposes of this plan) as a stand where hardwood species comprise more than 70 percent of the tree canopy. The most common hardwood species on the district are red alder, bigleaf maple and bitter cherry.

Hardwoods contribute to diversity in the forest structure in two ways. The small stands or patches of pure hardwoods provide for vegetative diversity in the conifer-dominated landscape. Hardwoods also play an important role in the development of layered stands by providing vertical diversity in conifer-dominated stands.

Approximately 1,100 acres of state forest lands meet the preceding definition of hardwood stands, of which 60 percent have been classified as closed single canopy, 30 percent understory (UDS), and 10 percent layered (LYR). On another 3,400 acres, hardwoods comprise more than 50 percent of the stand: Of these stands, 3 percent are classified as

regeneration; 25 percent as closed single canopy; 28 percent as understory; 36 percent as layered, and 8 percent as older forest structure (OFS).

The importance of hardwood stands on the landscape has only recently been recognized, and therefore the management of hardwoods is still evolving. The district will maintain a component of hardwoods, in both pure and mixed stands, using both standard silvicultural techniques and newer non-traditional practices.

Regeneration

The regeneration (REG) stand type currently comprises aproximately 28 percent (10,497 acres) of the district. These plantations are the result of reforestation of clearcuts and brush field conversions that have been done in the last 18 years. These stands have been predominately planted with Douglas-fir. More recently, however, planted seedlings have been a mixture of species including Douglas-fir, western hemlock, western red cedar, grand fir, western white pine, valley pine and Sitka spruce. Red alder from seed and big leaf maple from seed or stump sprouts often invade the stand naturally. Intermixed with the trees are a variety of grasses and shrubs.

Closed Single Canopy

The closed single canopy (CSC) stand structure covers 40 percent (15,216 acres) of the district and is primarily composed of two distinct types: plantations from 17 to 40 years old, and natural stands from 40 years old to over 100 years old.

The CSC plantations are generally well stocked with fast growing Douglas-fir. The crowns of these stands have closed, significantly limiting the amount of sunlight reaching the forest floor. There are very few plants that survive very long in the dim, shaded environment. In many of the stands the crowns have begun to lift and diameter growth has slowed.

The natural CSC stands are in a variety of conditions. However, all but a few of these stands are nearly pure stands of Douglas-fir. These stands will often have patches of sword fern or salal scattered across the forest floor. Some have been thinned in the past (or thinned themselves naturally) and are growing vigorously, while others have never been thinned and are severely overstocked. The lack of multiple tree species in the stand will hinder the development of a LYR structure.

A few of the CSC stands are composed primarily of red alder with a few scattered Douglas-fir or bigleaf maple. Many of these stands may be approaching the UDS stand structure with a layer of grasses, herbs, and shrub species. There are very few tree seedlings in the understory. Red alder is a relatively short-lived tree, when compared to conifer. The alders decline in health and die when they are between 70 and 100 years old. Most of these stands will be maintained on the landscape until they have reached their biologic maturity at about 50 to 70 years old.

Understory

The understory (UDS) stand structure comprises approximately 18 percent (6,748 acres) of the district. The UDS stands may be a result of natural stands that originally had a low stocking, natural stands that were partial cut one or more times in the 1970s and 1980s, and natural stands (or plantations) that were partial cut in the 1990s. Most of the UDS stands have a tree canopy that is composed primarily of Douglas-fir.

The naturally occurring UDS stands, and those that are a result of partial cutting 15 to 25 years ago, have an understory that is mainly composed of a thick layer of brush species (sometimes 15 to 20 feet tall), such as vine maple, hazel, salal, and others. Many of these stands do not currently have enough tree seedlings or saplings present to develop into a LYR structure. Some of these stands have fewer than 20 trees per acre of any species other than Douglas-fir. There are some UDS stands that have a large component of hardwood or conifer species, in addition to Douglas-fir.

In the UDS stands that resulted from the partial cutting of CSC stands in the last seven years, the understory vegetation is not as well developed as in the older UDS stands. In these stands, it may still be possible to conduct silvicultural activities that will encourage the establishment of a second layer of trees.

There are a few UDS stands that are dominated by red alder and/or bigleaf maple. The understory of these stands is usually composed of a tall, dense layer of a variety of brush species, such as salmonberry, vine maple, ocean spray, and sword fern. The UDS stands that do not have a significant component of conifers will be maintained until the hardwoods reach biologic maturity at about 50 to 70 years of age.

Layered

The layered (LYR) stand structure covers about 11 percent (4,124 acres) of the district. The LYR stands range from those stands that nearly meet the definition of OFS to younger stands that have just entered the LYR structure. The older LYR stands lack only the snags and down wood components required for OFS. The younger LYR stands have a main tree canopy of Douglas-fir and a second canopy composed of hardwoods, cedar, and/or hemlock.

Some of the LYR stands are composed primarily of red alder, and have fewer than 20 conifer trees per acre. Stands in this condition are very poor candidates for development into OFS, since the snag and down wood requirements would account for nearly all of the existing conifer trees and result in a red alder UDS stand. Because red alder is relatively short lived when compared to conifer trees, the LYR structure they support will fall apart in the short term cannot last long enough to develop into OFS. These LYR stands with a very limited conifer component will be maintained on the district until the hardwoods reach biologic maturity.

Older Forest Structure

Older forest structure (OFS) stands comprise about 2 percent (749 acres) of the district. They generally occur in small patches across the landscape. The main canopy of these stands is composed of Douglas-fir, while the other layers are composed of hardwoods or western hemlock. These stands may contain individual old conifer trees, but the stand would not be considered old growth. All of these stands have a well-developed brush understory, often dominated by vine maple.

Non-Silviculturally Capable

Non-silviculturally capable forest lands are defined in administrative rule OAR 629-35-0040 as not capable of annual wood production of 20 cubic feet per acre at culmination of mean annual increment. Only 185 acres on the district (less than 1 percent of the total) are classified as non-silviculturally capable. These acres are located on 3 sites: an estuary, a meadow with very shallow soils, and a forested area on a very poor site.

Management Activities in Each Stand Type

The annual harvest and silvicultural activities are summarized by activity in Table 6-5. The following section discusses the purpose and rationale for these activities in each of the stand structure types.

Regeneration Stands

Management practices for young stands will be applied to these acres 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 older forest structure, depending on current and future landscape designs. All current and future clearcut harvests are designed to incorporate live green trees, snags, and down wood. These structural components in the young plantation will assure proper function of REG stands throughout their growth and development.

Reforestation

Reforestation promptly follows all clearcuts and patch cuts. Spacing, species, and stock type depend on site-specific conditions and availability. A variety of conifer species are planted during reforestation, including Douglas-fir, western hemlock, western redcedar, and Sitka spruce. Red alder is sometimes planted in areas that contain root rot disease that is harmful to conifer species. Red alder and bigleaf maple are sometimes established in the reforestation areas through natural seeding from adjacent stands and stump sprouts (bigleaf maple only).

Site preparation and vegetation management activities are done to ensure stand establishment. These prescriptions are very site-specific and may include the use of prescribed fire, mechanized slash piling, herbicides, and manual labor to manage competing vegetation. Without these activities, the competing brush species will often out-grow, shade, and eventually kill the planted seedling. The purpose of these activities is not

to eliminate the brush species, but to provide the planted seedlings enough of a start so that they can successfully compete with the brush. Slash piling and prescribed fire reduce heavy fuel loads and create planting spots. Vegetation management prescriptions have been modified from past practices in order to maintain a larger component of hardwoods in the plantations.

Precommercial Thinning

The vigorous growth during the regeneration stage creates intense competition within the stand. In order to maintain health and growth, some of the trees are removed in a precommercial thinning. About 90 percent of the plantations on the district are precommercially thinned when they are between 12 and 18 years old. In this activity the smaller or weaker trees are cut out of the stands, thereby maintaining a healthy stand. Prescriptions for precommercial thinning are designed to maintain species diversity in the plantation, including red alder and bigleaf maple.

In some stands that are severely infected with Swiss needle cast or laminated root rot, a very heavy precommercial thinning, which removes most or all Douglas-fir trees, may be applied. This would be followed by an interplanting of species tolerant of the specific disease on that site.

Although precommercial thinning is important for continued stand growth and development, it depends on adequate funding. When funding cannot support the demand for precommercial thinning, then alternate methods of maintaining stand growth must be considered.

Pruning

Several years ago the district pruned some plantations, and is evaluating the effects of pruning on stem growth and quality, stand structure, and economic return. The district plans to complete the pruning of these plantations, which is normally done in two or three stages or lifts. This evaluation will be continued through the implementation plan period. Depending on the results of the evaluation, the district may prune additional plantations.

Closed Single Canopy Stands

Underplanting

Underplanting in a closed single canopy stand, is an effective way of starting stands on a path to a more complex condition. Conifer understories are a necessary component of layered and old forest structure stands. The underplanting process begins with a significant reduction in the overstory, and planting shade-tolerant species, such as western hemlock and western red cedar. Underplanting will occur only on sites well suited for this activity.

Partial Cut Harvest in Plantations

About two-thirds of the district's annual partial cut objective will occur in 25 to 35 year old plantations. These stands are typically in the closed single canopy stage. In this entry the smaller, suppressed trees are removed, leaving the larger trees with more growing

space. The thinning may leave the stand in CSC or move it toward UDS, depending on the amount of canopy closure left. The potential for forest layering may be improved, however, because the thinning reduces the density of the canopy cover, allowing more light to reach the forest floor. This encourages the development of grasses, forbs and brush species that are necessary components of understory stands. Hardwoods, another important component of more complex stands, are nearly all retained. Thinning at this stage, however, will not necessarily create a layered condition because the trees are small, and so relatively few snags and little down woody material can be created. The most severely overstocked CSC stands generally will not respond well to partial cutting. Typically, these trees have grown tall but have not gained much diameter. When the surrounding trees are removed in a partial cut, the remaining tall, thin trees tend to bend and break. The small tree crowns and reduced leaf surface limit the ability of overcrowded stands of this type to respond well after a partial cut.

Partial Cut Harvest in Natural Stands

Partial cuts in closed single canopy natural stands will comprise about 10 percent of the district's annual partial cut objective, and will contain a variety of ages, sizes, and stand densities. The harvest prescriptions for individual stands will be tailored to the desired future condition on the landscape, with the minimum objectives of placing stands on a pathway to an understory stand structure and maintaining or increasing species diversity, including the retention of most hardwoods. Prescriptions will utilize a variety of methods, including stand density, diameter limit, and patch cuts. It takes a few years after the harvest operation for the ground vegetation to grow enough for the stand to achieve the understory stand structure.

Clearcut Harvests

Swiss needle cast disease has severely stunted the growth of Douglas-fir in some plantations on the west portion of the district. Because partial cutting stands similar to these has been detrimental to stand health in other parts of the Coast Range, the best management strategy appears to be removal of the Douglas-fir and replacement with disease resistant species. About 27 percent of the district's annual clearcut objective will be composed of Closed Single Canopy plantations that are severely infected with Swiss needle cast. Moderately infected stands will be monitored and considered for clearcut if SNC increases in severity. A few clearcuts may also result from the treatment of laminated root rot. Portions of some plantations are infected with laminated root rot. The infection centers will normally be treated with small patch cuts (generally 1 to 5 acres) that remove the Douglas fir and retain the resistant species. These operations will be followed with planting resistant species. Occasionally the density and configuration of the infection centers may result in a small clearcut. Approximately 10 – 12 Douglas-fir trees per acre will be left to provide for future snags and down wood.

Approximately 24 percent of the clearcut harvest objective will be in older, severely overstocked Closed Single Canopy stands. Another 15 percent will be in Closed Single Canopy hardwood stands. The rationale for clearcutting these stands is that they are poor candidates for developing layered or older forest structure, and that the district has a large excess of CSC stands. Snags and down woody material will be created during these stand

entries; however, the amounts created will depend on site-specific conditions, including tree size, number of existing snags, and the amount and condition of the down wood.

In hardwood stands, particularly those with very few or small conifer trees, it will be necessary to meet the residual live tree, snag, and down wood goals using hardwood trees and logs. Although hardwood snags and down wood do provide short-term wildlife habitat and some other ecosystem needs, they do not persist long enough to provide the legacy necessary to achieve older forest structure. On these sites with very low conifer stocking, the district will develop site-specific prescriptions, which may include lower targets of residual trees, snags, and down wood, in order to meet the overall long term goals of the *Northwest Oregon State Forests Management Plan*.

Understory Stands

Underplanting

Underplanting may be done in an understory stand that has limited numbers of shade-tolerant conifer. Underplanting usually occurs after a partial cut harvest and will help the stand transition to a layered stand in the future. The planted species are typically western hemlock and western red cedar. Red alder and bigleaf maple may naturally regenerate in stands that have been partial cut. Underplanting depends on seedling availability and funding.

Partial Cut Harvests

Approximately 12 percent of the district's annual partial cut objective will occur in understory stands. Some of these stands occurred naturally, while others are the result of previous partial cut operations. Partial cut harvests in these stands are intended to reduce the canopy density, while maintaining and encouraging the development of complexity. Snags and down woody material will be created during these stand entries.

Clearcut Harvest

Some clearcutting will occur in understory stands that will not easily develop the complexity needed for LYR stands. About 25 percent of the district's annual clearcut objective will be composed of UDS stands.

The UDS stands that are not reasonable candidates to develop or maintain LYR or OFS consist of nearly pure Douglas-fir with fewer than 20 non-Douglas-fir trees per acre (usually red alder), and are over 70 years old. The understory vegetation of these stands is typically composed of a thick, overlapping shrub cover of species such as vine maple, hazel, or salal. Due to the height of the existing tree canopy and the difficulty in establishing seedlings in the thick understory vegetation, it would be prohibitive to develop these stands into LYR and OFS. In UDS stands with a high density of laminated root rot, the infection centers will normally be treated by creating 1 – 5 acre patch cuts that are planted with disease-resistant species. Occasionally the density and configuration of the infection centers may result in a clearcut. Snags and down woody material will be created during these stand entries.

Layered Stands

Partial Cut Harvests

Approximately 11 percent of the district's annual partial cut objective will occur in LYR stands. Some of these stands occurred naturally, while others are the result of previous partial cut operations. Partial cut harvests in these stands are intended to reduce the canopy density, while maintaining and encouraging further development of OFS components. Snags and down woody material will be created during these stand entries.

Clearcut Harvests

The LYR stands that are being considered for clearcut amount to about 9 percent of the district's annual clearcut objective and do not have the potential to maintain their current LYR structure or develop into OFS. These stands generally have a canopy of fewer than 20 Douglas-fir trees per acre, which are scattered among a second layer of red alder and a very dense understory. Red alder generally begins to decline at around 70 years of age, and as the red alder dies, these stands will deteriorate into brush fields with a few scattered conifers. In addition, the definition of older forest structure requires 8 trees greater than 32 inches diameter at breast height (DBH), enough other trees to create layering, 2 large snags, 4 smaller snags, and at least 3,000 cubic feet of down wood per acre. There are not enough trees on these sites to meet the OFS definition. Snags and down woody material will be created during these stand entries.

Older Forest Structure Stands

It is expected that OFS stands will remain in the old forest condition until a disturbance moves all or part of them to a more simple condition.

Partial Cut Harvests

To help foresters develop prescriptions and techniques that will maintain or improve stand growth and structure, some very limited partial cut trials may take place on approximately 20 acres of older forest structure. These trials will be planned in consultation with the staff silviculturist and biologist.

Clearcut Harvests

Because there are so few stands that are currently in OFS, no clearcuts are planned there during this implementation plan period.

Proposed Management Activities

Silvicultural Activities

Table 6-5. Annual Silvicultural Activities for Fiscal Years 2002 to 2011

Activity	Estimated Annual Acreages
Partial cut	700 – 1,100 acres[1]
Clearcut	70 – 110 acres[2,3]
Reforestation	
- Initial Planting	50 – 200 acres[4]
- Underplanting	20 – 200 acres
Precommercial Thinning	200 – 800 acres[5]
Fertilization	0
Pruning	0 – 100 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 clearcut harvest and LYR stands will be considered for clearcut harvest only with sufficient justification.
3. Diseased patch cuts greater than five acres will count toward the annual clearcut total.
4. Reforestation acres are higher than clearcut acres because it is anticipated that some of the partial cut acres will be reforested, when necessary.
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 6-5 above.

Roads

The desired future condition of the road system is one that safely provides for the district's transportation needs without significantly impacting water quality, and that also provides for fish passage. During the planning period, four types of road work will be done:

Construction — New roads will be constructed to provide or improve access to timber harvest or recreation areas.

Improvement — Existing roads will be upgraded to current standards, or maintained at the desired standards. Improvement is accomplished by realigning, widening, adding or replacing drainage structures, or adding surfacing as necessary.

Maintenance — Road maintenance will be done to keep roads at their desired standards, and to prevent any damage to the road and the surrounding environment. Work includes grading the road surface, cleaning the ditchlines, and cleaning the culvert inlets.

Closure — Work will be done to eliminate vehicle traffic from roads or sections of roads that are not currently in use. This work may involve barricading or vacating the roads. Roads are closed to reduce traffic-associated wear, water quality impacts, maintenance costs, operational conflicts, wildlife harassment, and vandalism.

The fundamental guidance for road management that will assist in achieving the desired future condition starts with the Level I planning document, the Forest Management Plan. For all intents and purposes the following forest management plan statement is true for this district: "The main road system is essentially complete. However, additional collector spurs and secondary spurs will still be needed to access future timber sale units." (ODF, NW Oregon, Forests Management Plan January 2001)

The next level of planning, Level II, is this "Implementation Plan" and more specific to roads is the "Transportation Plan". Elements of the transportation plan are described in the "Forest Roads Manual" (ODF 2000). District Transportation planning is currently in development. Following completion of watershed assessments and as district implementation plans are subsequently revised and updated, the complete transportation planning process will be applied. Transportation plans will describe current conditions of the road system, a vision for the future road system and the road construction, improvement and maintenance activities needed to reach that vision. Essential elements of the transportation plan are listed below:

Location — New roads will be located on ridge tops or gentle slopes whenever possible. When road locations are considered on steep slopes, engineering analysis and/or geotechnical review will be pursued to evaluate the probability of slope failure and the associated risk to resource damage. Roads will be designed to the standard needed to accomplish the planned management activity.

Use of Expertise (specialists) – Road management will be the responsibility of the Engineering Unit supervisor. Employees with specialized skills in forest engineering will make or review all decisions on road management. Site-Specific geotechnical evaluation of slope stability will be used at level II and III decision-making stages when deemed necessary. The annual operation planning process and during actual sale preparation are the primary times that Department Geotechnical specialist will be utilized. The Forest Management Plan further defines in more detail the hazard and risk levels that necessitate the use of Geotechnical evaluation.

Surfacing —High-use roads will be surfaced with crushed rock to a depth sufficient to allow all-weather use. Medium and low-use roads will be surfaced with crushed rock or material sufficient to allow for planned management activities. many low-use roads may not be surfaced, when these roads are planned for dry weather use, and will be closed or partially vacated upon completion of use.

Drainage — The district will maintain and upgrade a road drainage system that minimizes impacts to water quality and impediments to fish passage. This system will include maintaining and/or upgrading the ditch systems, disconnecting the ditch lines from the streams, and ensuring proper sizing, spacing, and installation of cross-drain culverts.

Current guidance requires that drainage structures will be designed to handle a fifty-year flood. Fish passage will be protected and enhanced by maintaining and/or upgrading the road system's stream-crossing structures. The most current structures have been evaluated for proper size and fish passage. District personnel have met with Oregon Department of Fish and Wildlife fish biologists to prioritize the replacement or modification of culverts that impede fish passage on known fish streams.

Excess sidecast — Sites that present a risk of sidecast failure with a significant risk of resource damage will be identified and the risks mitigated.

Abandoned roads — Roads that will be inventoried and then assessed to identify any potential for failures that would result in damage to forest resources. Identified sites will be rehabilitated where feasible to minimize the risk.

Road maintenance —Activities that will ensure access to the forest for various uses while minimizing adverse impacts to water quality and fish habitat from the road system. Inspections shall be routine unless road use changes or severe storms occurs. For periods of heavy rains when the potential of damage is high, a procedure will be established to identify, report, and repair problem areas in a timely manner.

Road closures — Roads will be assessed to identify segments that could be closed to restrict access, mitigate potential resource damage, or reduce maintenance costs. Identified roads will be barricaded or vacated as appropriate. All closed roads will be kept open to public non-motorized travel (hiking, biking, horse riding), with the exception of areas in active operations.

Inventory — During the last three years, road inventory data has been collected and is currently being formatted for analysis. Continued field checks of the road system will increase the accuracy of the information. New and revised data will be added to the database as new construction, improvement, and maintenance are completed. The forest road inventory identifies road issues in order to prioritize repair activity. Major elements of the inventory include stream crossing structures, sidecast fill on steep slopes, and road surface drainage systems. The road inventory data will be used to identify and prioritize road maintenance and improvement opportunities.

Table 6-6. Road Activities for the West Oregon District from Fiscal Year 2002 through Fiscal Year 2011, by Road Classification and Miles

	Low Use	Medium Use	High Use
Current Miles of Road	99 miles	112 miles	51 miles
New Road Construction	42 – 66 miles	2 – 3 miles	0 miles
Road Improvement	24 – 36 miles	22 – 34 miles	33 – 50 miles
Road Closure and Vacation	39 – 60 miles	3 – 5 miles	0 miles
Estimate Miles of Road in 2011	139 – 162 miles	112 miles	51 miles

Potential Road Activities

To accomplish the district's silvicultural objectives, it is estimated that between 44 and 69 miles of new road construction and between 79 and 120 miles of road improvement will be necessary over the entire district during the implementation planning period. This is broken down to 6 to 9 miles of new construction and 8 to 13 miles of road improvement for clearcuts, and 38 to 60 miles of new construction and 71 to 107 miles of road improvement for partial cuts. Additional details can be found in the **Basin Descriptions** section of this document.

Few or no new high-use roads will be required. Approximately 95 percent of the new roads will be low-use roads within timber sale areas. These spurs will be narrow and between 0.1 and 1.5 miles long. The medium-use roads that connect these sale areas to the mainline system make up the remaining 5 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.

Approximately 30 percent of the road improvement will be reconstruction necessary to upgrade road standards on older roads. On the remaining 70 percent, improvement will consist mainly of resurfacing and drainage improvements, in order to maintain their current standard.

Most of the newly constructed or improved unsurfaced roads providing access to the harvest units will be partially or fully vacated during the planning period.

The District is aware of the increase in recreational users on the forest road system. This use comes from OHV, hunting, fishing and sight-seeing. As part of the roads and recreation management there are on going efforts to improve and maintain road signage, update maps and improve communication with recreational users of active harvest operations.

Recreation

The *Recreation Resource Inventory and Assessment* for the district has been completed and approved. The report indicates that although recreation use on the district is not extensive, there are locations where the current levels of use provide opportunities for future improvements. The assessment describes the resources at those locations and the recommended improvements, some of which could be accomplished in the next ten years.

Big Elk Creek Campsite contains three undeveloped campsites near the stream. Two sites are accessed by surfaced roads, and the remaining site is accessed by an unsurfaced road that is currently closed. The recommendation for this area is to keep it undeveloped and limit management activity to providing adequate access to the campsites and protecting the resource from use impacts. The district will rock the remaining unsurfaced road that accesses one campsite, and will post signs to keep traffic on surfaced roads.

Baber Meadows provides a staging area for ATV users that ride a loop trail system that begins and ends at the meadow. Recently, access roads and parking areas have been surfaced and a restroom has been installed. In addition, there are some camping sites that are in the process of construction. District personnel will continue to work closely with the Mt. Baber ATV club in developing the recreational opportunities of the meadow area.

Yaquina Falls are a series of natural waterfalls located on both state and private land. This is a resource that could be developed for hiking and sightseeing in the future, especially if all of the falls were eventually located on state forest land, through the process of land exchange. If this were the case, it would still be a challenge to locate and build a trail system through very steep terrain that could access all of them. Since the most spectacular falls are currently on private land, and access to the falls on state forest land is extremely difficult, there are no management recommendations for the near future. If the potential land exchange occurs, and all waterfalls are on state forest land, the priority for developing this area would increase.

Black Rock is a parcel of ODF land located next to Tapawingo church camp. Camp visitors use state forest land for hiking and horseback riding. There is increasing use of the area by mountain bikers from the Salem area. ODF staff have recently made contact with the Black Rock Free Ride Association, a newly formed mountain bike club. It will be a priority to work with the club to develop the recreation opportunities at this site. In addition, Camp Tapawingo staff will be informed of forest operations that might affect their use of state forest lands at Black Rock.

Planning staff from the Northwest Oregon Area office will continue to conduct recreation use monitoring at these sites in the future.

Public Safety and Law Enforcement

Concern for public safety requires maintaining a high level of communication with recreational users. District staff attend meetings of the Mt. Baber ATV club and apprise them of activities on state lands in the vicinity of the staging area and trails that may be of concern to them. In addition, it will be a high priority to increase contact with the Black

Rock Free Ride Association mountain bike club and advise them of forest management activities in the area.

Benton, Polk, and Lincoln counties employ forest deputies that patrol private and state forest land. These individuals are responsible for law enforcement and also provide monitoring and investigation services.

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). After reviewing the state forest lands, ODFW fish biologists recommended Wolf Creek as a productive area for stream work in the form of large log placement. Enhancement projects have been done on this stream. Another enhancement project for Wolf Creek is in the planning stages. ODFW biologists will continue to be responsible for project designs and specific stream locations.

Cultural Resources

- Cultural resource inventories will be developed and completed within 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

No energy or mineral resources, including aggregate rock, have been identified on the district. In the event that an aggregate rock source is identified, the district will assess the amount and quality of rock present. If the assessment data indicates sufficient rock, the district will analyze resource protection issues and estimate long-term rock requirements.

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 evaluate operations that are proposed for Focused and Special Stewardship lands (visual subclass), to determine appropriate actions necessary to minimize and mitigate the visual impacts consistent with the management objectives in the strategies.

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 6-7) 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*.

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 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.

- In addition, the district will contribute to statewide efforts to reduce the quantity and range of invasive, non-native plant species. Two noxious weed are present on district state lands that require control measures. Herbicides are applied to Scotch broom and gorse in an effort to kill the plants and prevent then from spreading to other locations.

Table 6-7. West Oregon District Endangered, Threatened or Candidate Plant Species

Genus	Species	Subspecies	Common name[1]	Status	Record exists[2]	Potential to be present
Threatened and Endangered Plants						
Aster	*vialis*		Wayside aster	ST		✔
Castilleja	*levisecta*		Golden Indian-paintbrush	SE, FT		✔
Cordylanthus	*maritimus*	*palustris*	**Salt-marsh bird's beak**	SE		✔
Erigeron	*decumbens*		Willamette daisy	SE, FE		✔
Lomatium	*bradshawii*		Bradshaw's lomatium	SE, FE		✔
Lupinus	*sulphureus*	*kincaidii*	**Kincaids lupine**	ST, FT		✔
Sidalcea	*nelsoniana*		**Nelson's checkermallow**	ST, FT		✔
Candidate Plants						
Cimicifuga	*elata*		Tall bugbane	SC		✔
Montia	*howellii*		Howell's montia	SC		✔
Sidalcea	*hirtipes*		**Bristly-stemmed sidalcea**	SC		✔

[1]Plant names in bold are on the NW FMP list of plants.
[2]Plants have been observed on or in close proximity to state forest lands.

Status:
SE – State Endangered
ST – State Threatened
SC – State Candidate
FE – Federal Endangered
FT – Federal Threatened

Special Forest Products

The district will provide permits to harvest forest products such as moss, salal, and other plants on a request basis, consistent with product availability, protection requirements, and other resource management strategies. It will also periodically review and updated district policies, procedures, and product price listings.

Landscape Design Overview

The district intends to achieve much of its landscape design objectives through the creation of areas of desired future complexity (DFCCs), which will consist of layered, and older forest structure stand types. The locations of the DFCCs have been determined in consultation with biologists from the Oregon Department of Fish and Wildlife and the Oregon Department of Forestry. They are intended to provide interior forest wildlife habitat for species that are dependent on older forest types. Clearcut harvests are not planned for LYR or OFS stands in these areas during this implementation plan period, except to treat forest health problems.

The following criteria were considered when developing the placement of DFCCs on the landscape:

- Location of adjacent federal late successional reserves (LSRs).
- Marbled murrelet management areas.
- *Draft Northern Spotted Owl Recovery Plan* (USFWS 1992).
- Concentrated areas of complex stand structures.
- Isolated land parcels considered for exchange.

The proximity and amount of federal land were important factors in determining the proportions and locations of stand types for the desired future condition within the management basins. There is a large late successional reserve (BLM and Forest Service lands) adjacent to the Blodgett and Burnt Woods Ridge basins. Consequently, these management basins were designed to have slightly less area in the complex stand types than the district average.

The *Draft Northern Spotted Owl Recovery Plan* notes that the forest lands north of U.S. Highway 20 to the Columbia River, which include the Green Mountain and Bonner Ridge basins, are important for the recovery of northern spotted owls. In addition, the Green Mountain Basin has five marbled murrelet management areas and has a relative abundance of stands with well developed structure. Finally, there is only a small amount of federal land near the Green Mountain and Bonner Ridge basins. For these reasons, the Green Mountain and Bonner Ridge basins will have a somewhat higher proportion of layered and older forest structure than the district average.

In the Black Rock basin the older stands are, for the most part, 80 to 90 year old CSC and UDS. Because of the relative difficulties of creating complexity in this basin and the greater opportunities elsewhere, relatively little DFCC was designated.

Many of the scattered parcels are candidates for exchanges with other landowners. Because the silvicultural techniques for development of complex stands differ so radically from those practiced by most landowners, it is likely that a DFCC would be considered an

encumbrance by those interested in land exchanges with the State. For this reason, a limited number of scattered parcels have portions designated as DFCC. Parcels that currently support northern spotted owls and marbled murrelets will not be exchanged. Additionally, scattered parcels that have a high proportion of LYR and OFS will only be exchanged for similar habitat.

The district has currently identified 32 DFCCs, ranging in size from 54 acres to about 4,500 acres, and located throughout the district. As operations take place and stand structures develop over time, the district will look for additional areas to place smaller DFCC patches.

In addition to the DFCCs, corridors of the more complex stand structure types will be provided along streams. These corridors will provide some connectivity between the DFCCs within basins. However, the scattered nature of the parcels on the district and the interwoven multitude of other landowners make it impractical to plan for a continuous corridor from the management basins south of Highway 20 to the basins in the northern part of the district.

The development of the DFCCs and the desired future condition stand structures is a long-term process. It is influenced by the five criteria used to select areas of future complexity and the condition of the existing stand structures.

It will be difficult to move some UDS stands to a LYR structure because they lack tree species diversity, and there are some LYR stands that lack sufficient conifer trees to develop into OFS. Therefore some of the existing complex structures have not been included in DFCCs, especially where they do not meet one of the five criteria used to designate them.

Conversely, some relatively young, simple stands have been included in DFCCs because district staff foresters have found that introducing complexity into stands in the initial stages of their development may be one of the more efficient and effective way to produce early development of older forest structure components.

Management Basins

Management Basins Overview

The district has been divided into 6 management basins (Table 6-8). These basins follow the boundaries of sub-basins delineated by the Department of Water Resources, with 3 exceptions. The first exception is the Scattered Coastal Management Basin. This basin consists of parcels of 640 acres or less in the North Oregon Coastal Basin that are more than 2 miles from large blocks of state forest lands. These lands are difficult to manage efficiently and many parcels are a priority for land exchange. Another exception is Black Rock Basin, which is a separate management basin due to its distance from other state forest lands. The last exception is the headwaters of the Yaquina River, which has been included in the Green Mountain Basin because of its close proximity to other state forest lands, rather than the Burnt Woods Ridge Basin, which is located in the Yaquina sub-basin.

Table 6-8. West Oregon District Planning Basins (listed in order of size).

Management Basin	Acres	District Percent
Burnt Woods Ridge	13,682	36%
Green Mountain	10,063	27%
Blodgett	5,472	14%
Bonner Ridge	4,397	12%
Scattered Coastal	3,081	8%
Black Rock	976	3%

Basin Descriptions

Burnt Woods Ridge

This basin is the largest on the district (13,682 acres), and is located entirely in Lincoln County. About 11,300 acres occur in one contiguous block. The other 2,400 acres occur in 8 parcels of various sizes. Nearly all of these parcels are located south of Highway 20, north of Big Elk Creek, west of Burnt Woods, and east of Toledo.

The southern portion of this basin is in close proximity to the Siuslaw National Forest. The western portion of the basin is intermixed with lands belonging to Plum Creek Timber Company and Simpson Timber Company. The eastern portion is mostly adjacent to lands owned by small non-industrial landowners.

There are no known spotted owls on or near state lands in this basin. A thirty acre marbled murrelet management area with an associated 150 acre buffer has been established in a stand adjacent to Salmon Creek.

The major streams in this basin are the Little Yaquina River, Salmon Creek, Cline Creek, Big Elk Creek, Little Elk Creek, Deer Creek, Wolf Creek, Spout Creek, and Johnson Creek. Big Elk Creek has been designated a water quality-limited stream for most of its length by the Department of Environmental Quality, under the 303(d) rule. The reasons for this listing are habitat modification, sedimentation, and summer temperature. The Department of Forestry manages lands for a length of about one mile on both banks of this creek. There is one registered domestic water right located on state forest lands, and 17 more are located within 1,000 feet of state forest property boundaries.

There are 34 miles of fish-bearing streams on state lands in the Burnt Woods Ridge basin. Portions of Salmon Creek, Deer Creek, Wolf Creek, Spout Creek, and Johnson Creek have been determined to be important salmon habitat. During the last few years, the district conducted two stream habitat improvement projects on portions of Wolf and Salmon Creeks, with direction from the Oregon Department of Fish and Wildlife. Another habitat improvement project for Wolf Creek is in the planning stages.

There are a number of areas with unstable soils in the Cline Creek drainage, with several active slides. Some state forest lands adjacent to the south side of Big Elk Creek are also unstable.

Recreation on state lands in this basin includes a frequently used undeveloped campground adjacent to Big Elk Creek. In addition, the Baber meadows area is used by the Mt. Baber ATV club as a camping, staging, and riding area. District personnel continue to work with the club to further develop the recreation potential of this area. Other recreation opportunities include dispersed hunting, fishing, and camping.

Nearly all of the state forest lands in this basin are in an open range area. Cattle are occasionally found along Wolf Creek, Bear Creek, Baber Ridge Road, and Devil's Well Road.

Infections of Swiss needle cast are severe in a few plantations on the western side of the basin.

Table 6-9. Burnt Woods Ridge Basin: Current Condition, Post Implementation Plan Condition, and Desired Future Condition, by Stand Structure and Percentage

	REG	CSC[2]	UDS[3]	LYR[4]	OFS	NSC
Current Condition	34	39	14	12	0	1
Post Implementation Plan Condition[1]	9	48	30	12	0	1
Desired Future Condition	12	20	25	24	18	1

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.

Key Resource Considerations

- Big Elk, Wolf, Bear, Cline, Spout, and Salmon creeks.
- Coho salmon and steelhead trout are present in several streams.
- Recreation sites (Big Elk and Baber Meadows).
- Swiss needle cast.
- Marbled Murrelet Management Area

Desired Future Condition and Landscape Design

Two important factors for the basin's desired future condition are the lack of shade-tolerant conifer species necessary to develop complex stand structures, and the close proximity of a large, late successional reserve, on Forest Service and BLM lands. The proportion of desired stand types for this basin is comparable to the district average. There will be slightly more acres in the regeneration type, and a few less in the older forest structure type.

The planned landscape design for the basin will consist of a 4,500-acre DFCC, which will provide a corridor from near Big Elk Creek to the Tum Tum River in the Blodgett Basin. One 750 acre DFCC is located south of Little Elk Creek and brackets Salmon Creek. There are also seven 120 to 300 acre DFCCs near Johnson, Beaver, Bear, Spout, Big Elk, and Little Elk Creeks; and at Randall Saddle.

Proposed Management Activities

Harvesting

Approximately 2,260 to 3,380 acres of partial cutting will take place in this basin during the implementation plan period. More than half of the partial cutting will be first harvest entries into plantations. However, operations will also occur in older CSC, UDS, and LYR stands.

The estimated clearcut harvest will be between 280 and 410 acres during the implementation plan period. About half of the clearcuts in this basin will be in the older, overly dense CSC stands, which are poor silvicultural candidates for developing into more complex stands. The remaining clearcuts will be in UDS and LYR stands that are poor silvicultural candidates for developing OFS.

Road Construction and Improvement

During the implementation plan period, approximately 2 to 3 miles of new road will be constructed for clearcuts, and between 12 and 18 miles for partial cuts. Construction will consist of extending existing medium-use roads (collector spurs) and building short low-use roads (single spurs) or landings along existing roads.

Approximately 3 to 5 miles of existing road will be improved for clearcuts, and approximately 22 to 33 miles for partial cuts. The improvement work will be completed to upgrade or maintain the standards of the road and drainage systems.

Green Mountain

This is the second largest basin on the district, containing 10,063 acres. Nearly all of the lands in this basin are in one parcel (8,600 acres), while the rest of the land is in 6 other parcels ranging in size from 11 to 950 acres. The lands in this basin are located northwest of the community of Summit and east of Logsden. Most of the lands are in the extreme southwest corner of Polk County, with about 2,000 acres extending south along the Lincoln-Benton county line.

The state forest lands in this basin are adjacent to 4 parcels of BLM lands that total about 2,000 acres. These lands generally contain older, more complex forests than the state forest lands. Boise Cascade Corporation owns over 50,000 acres immediately to the north of state forest lands. Plum Creek Timber Company owns most of the lands to the west of the basin, and Simpson Timber Company owns land to the south. There are also a number of adjacent small industrial and non-industrial landowners.

There are five marbled murrelet management areas on state lands in the Green Mountain basin that contain 683 acres, with buffers encompassing an additional 1600 acres. These areas are located on or near Knife Ridge, and Little Grass Mountain, Green Mountain, and Steere Creek.

The major streams and rivers in this basin are the Yaquina River, the Little Yaquina River, Big Rock Creek, South Fork of Rock Creek, Fall Creek, and Steere Creek. There are 24 miles of fish bearing streams in the Green Mountain basin. Portions of the Yaquina River and Big Rock Creek are important salmon streams. A stream habitat improvement project has been completed on a portion of the South Fork of Rock Creek. The Siletz River has been designated a water quality-limited stream from its mouth to Rock Creek because of excessive water temperature. The designation starts about 5.5 miles downstream from state forest lands. There is one registered domestic water right on state forest lands in this basin and ten more domestic water rights within 1,000 feet of state forest property boundary.

The Green Mountain basin has some of the longest and steepest slopes on the district. There are a few areas of unstable soils that need to be considered when conducting forest management activities.

The portion of this basin in Lincoln County is open range. Cattle are frequently found along Big Rock Creek, Steere Creek, and the South Fork of Rock Creek.

Although there is a relatively high proportion of regeneration stands in the Green Mountain basin many are older and will soon be moving into the closed single canopy type. Western hemlock understories in the higher elevations result in the highest percentage of stands with well-developed layering on the district. Many of the LYR stands in this basin would be classified as OFS if they contained more snags and down woody debris.

There is a natural meadow of about 50 acres (10 acres are on BLM land) on Little Grass Mountain. This meadow is slowly being invaded by Douglas-fir and will eventually disappear unless preventive measures are taken. To maintain the meadow, a prescribed burn was completed in 2000 and others will follow as needed.

Table 6-10. Green Mountain Basin: Current Condition, Post Implementation Plan Condition, and Desired Future Condition, by Stand Structure and Percentage

	REG	CSC[2]	UDS[3]	LYR[4]	OFS	NSC
Current Condition	27	42	13	14	4	<1
Post Implementation Plan Condition[1]	8	42	32	14	4	<1
Desired Future Condition	6	14	33	20	27	<1

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.

Key Resource Considerations

- Marbled Murrelet Management Areas.
- *Draft Northern Spotted Owl Recovery Plan* (USFWS 1992).
- Yaquina River, Little Yaquina River, Steere Creek, Big Rock Creek, and the South Fork of Rock Creek.
- Coho salmon and steelhead trout are present in some streams.
- Desired future condition calls for higher proportion of layered and older forest structure.
- Swiss needle cast on western side of basin.

Desired Future Condition and Landscape Design

The factors influencing the Green Mountain basin's desired future condition are its distance from any large late successional reserves; the presence of five marbled murrelet management areas, and the fact that most state forest lands in this basin are in one large block. For these reasons, this basin will have a higher proportion of the complex forest stand structures and a lower proportion of the regeneration stand structure. An additional landscape factor is the close proximity of the Marys River, the Yaquina River, and the South Fork of Rock Creek which is a branch of the Siletz River. At one point, all three are less than 2 miles apart.

The DFCCs tie the older forest on the intermixed parcels of BLM lands together with the marbled murrelet management areas on state forest lands. To the degree that it is possible with the land ownership pattern, the Siletz, Yaquina, Luckiamute, and Marys River watersheds have been linked with a 2,100 acre DFCC along Steere Creek through forest on BLM lands to a 930 acre DFCC on Green Mountain. There are five other DFCCs, two that bracket the Yaquina River, one in the headwaters of Little Rock Creek and another on Knife Ridge.

Proposed Management Activities

Harvesting

Between 1,800 and 2,800 acres of partial cutting will take place in this basin, in all of the stand structure types, except regeneration. Most of the partial cuts will be first entry harvests in plantations. Clearcuts in the basin will be between 170 and 250 acres during the implementation plan period. Most of the clearcuts will consist of 25 to 40-year-old plantations with severe infections of Swiss needle cast. The other clearcut acreage will be in the older, overly dense CSC stands, or in the UDS and LYR stands.

Road Construction and Improvement

During the implementation plan period, approximately 1 to 2 miles of new road will be constructed for clearcuts, and between 10 and 15 miles for partial cuts. Construction will consist of extending existing medium-use roads and building short, low-use roads or landings along existing roads.

Approximately 2 to 3 miles of existing road will be improved for clearcuts, and approximately 18 to 27 miles for partial cuts. The improvement work will be completed to upgrade or maintain the standards of the road and drainage systems.

Blodgett

This basin extends from the summit of the Coast Range (roughly Cline Summit on Highway 20), east to Blodgett, and from about two miles north of Blodgett south to the lower slopes on the north side of Marys Peak. It is the third largest on the district, located in both Lincoln and Benton counties, and contains 5,472 acres. State forest land in the Blodgett basin is composed of 12 parcels of land ranging in size from 40 acres to 1,870 acres.

The southwest portion of this basin is adjacent to the Siuslaw National Forest. Starker Forests, Inc., Thompson Timber Company lands and a small number of private lands are on the remaining borders.

There are no known northern spotted owls or marbled murrelets on state forest lands in this management basin. The nearest spotted owl habitat is on Marys Peak, over 1.5 miles from any state forest property boundaries.

The major streams and rivers in this basin are the Marys River, the Tum Tum River, Shotpouch Creek, Lasky Creek, and Bark Creek. A small part is actually located in the Spout Creek watershed of the Yaquina River. The Marys River has been designated a water quality-limited stream from its mouth through Philomath. However, the designation starts about 14 miles downstream from state forest lands. The reasons for the designation are flow modification, summer temperature, and fecal coliform. The Marys River and its tributaries contribute to the water supply for the city of Philomath. There are two registered domestic water rights on state forest land and seven more within 1,000 feet of the state forest property boundary. Nine miles of the streams in the Blodgett basin are fish-bearing.

The Willamette Valley and several areas designated for smoke management are relatively close to the Blodgett basin. In order to protect the valley air quality, site preparation methods other than broadcast burning are used with relative more frequency there.

The UDS stand structure goal has been met in this basin but there is currently a high proportion of the REG and CSC stand types, and low levels of LYR and OFS stand types.

Table 6-11. Blodgett Basin: Current Condition, Post Implementation Plan Condition, and Desired Future Condition, by Stand Structure and Percentage

	REG	CSC[2]	UDS[3]	LYR[4]	OFS	NSC
Current Condition	24	39	29	7	1	0
Post Implementation Plan Condition[1]	12	28	51	8	1	0
Desired Future Condition	12	19	25	23	21	0

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.

Key Resource Considerations

- Marys River, Shotpouch, Lasky, and Bark Creeks.
- Adjacent to many rural residences.

Desired Future Condition and Landscape Design

The major factors influencing this basin's desired future condition are the small size and scattered nature of the state forest land parcels, lack of existing shade-tolerant conifer species, and the close proximity of the Siuslaw National Forest. For these reasons, the proportion of complex stands in this basin will be slightly less than the district average. Two medium-sized DFCCs are planned for this basin. One DFCC is about 1,200 acres, and is planned for the area between Lasky and Bark creeks. The second DFCC, which is about 800 acres, is planned for the portion of the basin west of Burnt Woods, which will tie into a DFCC in the Burnt Woods Ridge Basin. Two smaller DFCCs, about 250 acres each, are planned for an area along the Marys River north of Blodgett and on Goat Ridge, west of Shotpouch Creek. These four areas total about 2,600 acres.

Proposed Management Activities

Harvesting

Approximately 1,600 to 2,300 acres are scheduled for partial cutting during the implementation plan period. The partial cutting will occur in CSC, UDS, and LYR stands. About 45 percent of the partial cut operations will be first entry harvest in plantations.

Clearcut harvest during this period will be 60 to 90 acres. Most of these clearcuts will be in the older, overly dense CSC stands, which are poor silvicultural candidates for developing more complex stands.

Road Construction and Improvement

During the implementation plan period, approximately 1 mile of new road will be constructed for clearcuts, and between 8 and 13 miles for partial cuts. Construction will consist of extending existing medium-use roads and building short, low-use roads or landings along existing roads.

Approximately 1 mile of existing roads will be improved for clearcuts, and approximately 15 to 23 miles of existing roads will be improved for partial cuts. The improvement work will be completed to upgrade or maintain the standards of the road and drainage systems.

Bonner Ridge

This is the fourth largest basin in the district, with 4,397 acres, located entirely in Benton County. It is composed of 5 parcels ranging in size from 40 to 3,270 acres. It is located about 6 miles north of Blodgett, between the west fork of the Marys River and the Luckiamute River, on the east side of the Green Mountain Basin.

The adjacent landowners in this basin are primarily small industrial companies or non-industrial individuals. Starker Forests, Inc. and Swanson Group, Inc. are the major landowners adjacent to the state forest lands.

There are no spotted owls currently on state lands or close enough to impact forest management operations.

The major streams and rivers are the East and West Forks of the Marys River; Luckiamute River; Oleman Creek; Bottger Creek; and Bonner Creek. The Marys River and its tributaries contribute to the water supply of the city of Philomath. There are no registered domestic water rights on state forest land but there are 3 within 1,000 feet of state forest property boundaries. About 10 miles downstream from state forest lands, the Luckiamute River is listed as a water quality-limited stream, because of fecal coliform. There are 8 miles of fish-bearing streams and the Luckiamute River supports steelhead trout.

The relative proximity of the Bonner Ridge basin to the Willamette Valley and several areas designated for smoke management requires the less frequent use of broadcast burning for site preparation.

Western hemlock is present in parts of this basin and will provide an increased opportunity for layering. This basin is one of two that currently contain no older forest structure.

Table 6-12. Bonner Ridge Basin: Current Condition, Post Implementation Plan Condition, and Desired Future Condition, by Stand Structure and Percentage

	REG	CSC[2]	UDS[3]	LYR[4]	OFS	NSC
Current Condition	23	40	32	5	0	0
Post Implementation Plan Condition[1]	8	35	52	5	0	0
Desired Future Condition	5	14	28	22	31	0

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.

Key Resource Considerations

- *Draft Northern Spotted Owl Recovery Plan* (USFWS 1992).
- Marys and Luckiamute rivers, Oleman, Bonner, and Bottger creeks.
- High densities of laminated root rot infection centers.

Desired Future Condition and Landscape Design

The factors influencing this basin's landscape design and desired future condition are the lack of a late successional reserve in the area, the basin's proximity to the Green Mountain Basin, and the fact that most state forest lands in this basin are in one parcel. For these reasons, this basin has a higher proportion of complex structures than the district average. This basin contains four DFCCs. One of 1,500 acres straddles Bonner Ridge and links the Marys and Luckiamute watersheds. There are two DFCCs on Bonner Creek of 400 and 200 acres, and one of 200 acres on Bottger Creek.

Proposed Management Activities

Harvesting

During the implementation plan period, approximately 900 to 1,400 acres will be partial cut in CSC, UDS, and LYR stands. About 40 percent of the partial cuts will be first entry harvest in plantations.

Clearcut harvest in this basin will consist of 30 to 50 acres, either in stands that are infested with laminated root rot or in the older, overly dense CSC stands that are poor candidates for developing more complex stands.

Road Construction and Improvement

During the implementation plan period, approximately 0.5 miles of new road will be constructed for clearcuts, and between 5 and 8 miles for partial cuts. Construction will consist of extending existing medium-use roads and building short, low-use roads or landings along existing roads.

Approximately 0.5 miles of existing road will be improved for clearcuts, and approximately 9 to 14 miles for partial cuts. The improvement work will be completed to upgrade or maintain the standards of the road and drainage systems.

Scattered Coastal

This basin is the second smallest basin on the district (3,081 acres), but it is spread across the largest area. It consists of 14 parcels ranging is size from 70 to 640 acres. Most of the parcels are between Eddyville, Logsden, and Siletz, but there are parcels scattered from Newport to Yachats and Alsea. One of the parcels is in Benton County and the rest are in Lincoln County. This management basin is located in both the Alsea and the Siletz-Yaquina sub-basins.

In the northern portion of this basin, the adjacent landowners are generally the large industrial forest industries such as Plum Creek Timber Company and Simpson Timber Company. In the southern portion, the adjacent landowners are a variety of large industrial timber companies, federal agencies and a few private non-industrial landowners.

In the Siletz-Yaquina sub-basin, state forest lands contain portions of the following streams: Long Prairie Creek, Stoney Creek, East Fork Bales Creek, and Pooles Slough. The parcel adjacent to Pooles Slough contains approximately 30 acres of tidal flats. The only fish-bearing stream on state forest lands in the Alsea sub-basin is a one mile portion of Digger Creek. Long Prairie Creek and Sam Creek in the Siletz River system have been identified as important salmon streams. The district completed stream habitat improvement projects on Long Prairie Creek in 1998 and 2000, in cooperation with the Oregon Department of Fish and Wildlife. There are no registered domestic water rights on state forest land in this basin.

There are two spotted owl activity centers, both located about 0.5 miles from state forest lands; one is near Alsea and the other is near Table Mountain. The associated management circles contain 488 acres of state forest lands. There are three marbled murrelet management areas. One is located near Logsden, one near the east fork of Bales Creek and

the other is on Long Prairie Creek. These areas cover 330 acres and are buffered by another 370 acres.

This basin currently has the highest percentage of closed single canopy stands.

Table 6-13. Scattered Coastal Basin: Current Condition, Post Implementation Plan Condition, and Desired Future Condition, by Stand Structure and Percentage

	REG	CSC[2]	UDS[3]	LYR[4]	OFS	NSC
Current Condition	24	51	11	9	3	2
Post Implementation Plan Condition[1]	13	49	24	9	3	2
Desired Future Condition	12	20	20	23	23	2

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.

Key Resource Considerations

- *Draft Northern Spotted Owl Recovery Plan* (USFWS 1992).
- Tidal flats.
- Marbled murrelet management areas.
- Long Prairie and Sam creeks.
- Chinook salmon and steelhead trout are present in some streams.
- Infestations of Swiss needle cast.

Desired Future Condition and Landscape Design

Many of the parcels in this management basin have a high priority for land exchanges, and this basin will have a lower proportion of the more complex stand structures. In addition, the small size of the parcels will not permit the creation of large DFCCs. The strategy for designating areas of future complexity in this basin is to build complexity around marbled murrelet management areas and to increase the number and improve the distribution of DFCCs across the landscape. This results include a 400 acre DFCC near Long Prairie Creek, one of 160 acres near Logsden, a 320 acre DFCC on Table Mountain, one of 300 acres on Norton Hill, one of 50 acres in Pooles Slough, a 110 acre DFCC near Tracy Creek, and one of 110 acres near Bales Creek.

Proposed Management Activities

Harvesting

Between 470 and 700 acres will be partial cut in this basin during the implementation plan period. Over 80 percent of these operations will be in closed single canopy stands, most of which will be first entry harvests in plantations.

The estimated clearcut harvest in this basin will be between 150 and 230 acres. Approximately 70 percent of the clearcut harvest will be in stands that are severely infected with Swiss needle cast. The remaining harvest will be in other CSC stands.

Road Construction and Improvement

During the planning period, approximately 1 to 2 miles of new road will be constructed for clearcuts, and 2 to 4 miles for partial cuts. Construction will consist of extending existing medium-use roads and building short, low-use roads or landings along existing roads.

Approximately 2 to 3 miles of existing road will be improved for clearcuts, and approximately 5 to 7 miles for partial cuts. The improvement work will be completed to upgrade or maintain the standards of the road and drainage systems.

Black Rock

Black Rock, at 976 acres, is the smallest basin on the district. It is a single parcel located ten miles north of other state forest land and about seven miles southwest of Dallas in Polk County. It is situated on the north side of the Little Luckiamute River, about two miles west of Falls City.

This basin has three adjacent landowners: Boise Cascade Corporation, Weyerhaeuser Co. , and Camp Tapawingo. The camp, which is privately owned and operates mostly in the summer, is about 160 acres and bordered on three sides by state forest lands.

There are no known marbled murrelets in this basin. A single northern spotted owl site in the vicinity of state forest lands and the management circle associated with it contains 689 state forest acres.

The south edge of this basin borders the Little Luckiamute River for about 0.5 miles. In addition, there are several small creeks, but the only one with a name is Sams Creek. There is one registered domestic water right on state forest land, which belongs to Camp Tapawingo. There is one other domestic water right within 1,000 feet of state forest lands. Mercer Reservoir, which is the water supply for the city of Dallas, is located about 1.5 miles north of this basin, with a couple acres of state forest land in its watershed. In this basin there are about two miles of fish bearing streams.

With an average Douglas-fir 50-year site index of only about 116, the soils in this basin have the lowest average productivity on the district. In addition to the lower site productivity, laminated root rot is also common and will affect prescriptions in partial cut operations. Black Rock contains some of the gentlest terrain on the district. Only about 10 percent of the area classified as steep and the remaining slopes are gentle to moderate.

Because it is located adjacent to Camp Tapawingo and is relatively close to Salem, Black Rock has a higher per-acre recreation use than any other basin on the district. People using the camp often hike, horseback ride, and mountain bike. In addition, a newly formed mountain bike club is expanding the existing trail system, with cooperation and assistance from department staff.

This basin was, for a time, managed cooperatively with the College of Forestry at Oregon State University as the George T. Gerlinger State Experimental Forest. Most of the research conducted there occurred over the last 50 years. More recently, the plots have only been intermittently remeasured, and many of them have been abandoned.

The proximity of the Willamette Valley, Salem and other areas designated for smoke management, require the less frequent use of broadcast burning for site preparation in Black Rock.

This basin is one of two that currently contain no older forest structure.

Table 6-14. Black Rock Basin: Current Condition, Post Implementation Plan Condition, and Desired Future Condition, by Stand Structure and Percentage

	REG	CSC[2]	UDS[3]	LYR[4]	OFS	NSC
Current Condition	24	31	41	4	0	0
Post Implementation Plan Condition[1]	11	43	42	4	0	0
Desired Future Condition	17	28	37	3	15	0

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.

Key Resource Considerations

- Single spotted owl site in the vicinity.
- Camp Tapawingo (recreation, viewshed, and water supply).
- Little Luckiamute River.
- *Draft Northern Spotted Owl Recovery Plan* (USFWS 1992).
- High densities of laminated root rot infection centers.
- OSU research plots.

Desired Future Condition and Landscape Design

The ability to create additional forest complexity in this basin is limited by the advanced age and over–dense condition of its stands. Because it is not practical to try to introduce complexity in old, dense stands, the percentage of lands designated for future complexity is

significantly lower than that of other basins. One DFCC was placed along the southern edge of the parcel, covering 190 acres.

Proposed Management Activities

Harvesting

During the implementation plan period, there will be 220 to 330 acres of thinning, mostly in CSC or UDS stands and 14 to 22 acres of clearcuts designed to address forest health issues.

Road Construction and Improvement

During the implementation planning period, between 1 and 2 miles of new road will be constructed for partial cuts. Construction will consist of extending existing medium-use roads and building short, low-use roads or landings along existing roads.

Road improvement for partial cuts will be approximately 2 to 3 miles of existing road. The improvement work will be completed to upgrade or maintain the standards of the road and drainage systems.

Information Summary For All Management Basins

Table 6-15 on the next page summarizes information for all management basins.

Table 6-15. Summary: Current Condition (CC) and Desired Future Condition (DFC), Stand Structure and Percentage

Management Basin	Acres	NSC/ Non-Forest**		REG		CSC		UDS		LYR		OFS	
		CC	DFC	CC	DFC	CC	DFC	CC	DFC	CC	DFC	CC	DFC
Black Rock	976	0	0	24	17	31	28	41	37	4	3	0	15
Blodgett	5,472	0	0	24	12	39	19	29	25	7	23	1	21
Bonner Ridge	4,397	0	0	23	5	40	14	32	28	5	22	0	31
Burnt Woods Ridge	13,682	1	1	34	12	39	20	14	25	12	24	0	18
Green Mountain	10,064	<1	<1	27	6	42	14	13	33	14	20	4	27
Scattered Coastal	3,081	2	2	24	12	51	20	11	20	9	23	3	23
District Total	**37,672**	**1**	**1**	**28**	**10**	**40**	**17**	**18**	**27**	**11**	**22**	**2**	**23**

* The Desired Future Condition will be achieved in an estimated 70 to 80 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).

Stand structure percent ranges specified in the *Northwest Oregon State Forests Management Plan*:

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

This implementation plan will move stands toward the desired future condition while maintaining options for future landscape design considerations. The desired future condition will provide a range of stand structures that will meet habitat requirements for a full assortment of native plant and animal species.

Expected Outputs and Habitat Achievements

The management activities proposed in this implementation plan contribute toward the desired future structure targets as outlined in Table 6-16. This table is an estimate of the structure development and the actual stand structures that will be present at the end of this 10-year period. The district's annual operations plan will include a description of how each year's silvicultural activities contribute toward meeting the desired future condition goals.

At the projected clearcut harvest rates (see Table 6-17), the district will drop from its current level of 28 percent REG stand structure to its desired future condition of 10 percent by the end of the implementation plan period (2011). The proportion of REG structure will drop slowly during the first two years of the implementation plan, because of the relatively high harvest levels between the years 1985 and 1989. After the year 2003, the proportion of REG will decrease rapidly, which corresponds to a decrease in clearcut harvest on the district after 1990.

The annual clearcut harvest objective is between 70 and 110 acres. The majority of clearcut harvest conducted during this implementation plan period will occur in the CSC stand structure. These harvests will be either in stands that are poor candidates for developing LYR or OFS, or stands that have severe forest health problems. In addition, the percent of stands currently in the CSC structure exceeds the goals set for the desired future condition.

The remaining clearcut harvest will be in the UDS and LYR stands that are not good candidates for developing into or continuing to be LYR stands. The UDS stands clearcut during the implementation plan will be replaced by many more UDS stands that will be

created during this period by partial cutting. There should be no net loss of LYR stands, because some of the existing UDS stands will develop into LYR stands.

The annual partial cut harvest objective is between 700 and 1,100 acres. Approximately two-thirds of these harvests will be in plantations, while the remaining partial cuts will be in natural stands.

During the implementation plan period, about 6,000 acres of CSC stands will be partial cut, which should result in UDS stands 5 to 7 years after harvest. By the end of the implementation plan period, or shortly after, the district should meet its UDS desired future condition goal of 27 percent. Even with this level of partial cutting and the clearcutting discussed above, the amount of CSC stands will continue to increase during the next decade. During the following decades the number of acres in CSC will decline with additional thinning.

An additional 2,000 to 4,000 acres of partial cutting will take place in UDS and LYR stands during the implementation plan period. This will continue many of those stands on a pathway to the LYR and OFS. Because LYR and UDS take more than 10 years to fully develop, we do not expect significant increases in the amounts of these stand types stands during the implementation plan period.

Table 6-16. Anticipated Stand Structure Development by 2011

	REG	CSC[2]	UDS[3]	LYR[4]	OFS
Current Condition	28	40	18	11	2
After Implementation Plan Period[1]	9	41	36	11	2
Desired Future Condition	10	17	27	22	23

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 total of the numbers for stand conditions do not include NSC/NF.

The annual volume harvested between 2001 and 2011 is expected to be between 8 and 13 MMBF (million board feet), as shown in Table 6-17. Approximately 80 percent of this volume will come from partial cuts. About three-quarters of the partial cut volume (or one-half of the total volume) will be first entry operations, which produce small, low-value logs. The remaining partial cuts and clearcuts will produce larger, higher quality forest products.

Table 6-17 shows the timber outputs that will be produced each year through this implementation plan, while Table 6-18 shows the habitat achievements the district expects to develop each year during the implementation plan period.

Table 6-17. Annual Partial Cut and Clearcut Harvest Objectives, by Volume and Acres

Partial Cut		Clearcut		Total
Acres	**MMBF**	**Acres**	**MMBF**	**MMBF**
700 – 1100	6.0 – 10.0	70 – 110	1.6 – 2.5	7.6 – 12.5

Table 6-18. Estimated Annual Habitat Achievements for Partial Cuts and Clearcuts for Fiscal Years 2002 to 2011

Harvest Type	Structure Development (acres)	Snag Retention[1] (snags)	Down Wood Recruitment[2] (thousand cubic feet)	Green Tree Retention[3] (trees)
Clearcut	70 –110	140 – 220	42 – 66	350 – 550
Partial Cut	700 – 1,1000	175 – 275	11 – 25	Not Applicable

1. Snag retention levels – younger partial cuts may not include snag creation; older partial cuts will have a target of 1 or 2 snags per acre, and clearcuts 2 snags per acre.
2. Down wood recruitment levels – average of 100 cubic feet per acre in older partial cuts, and average of 600 cubic feet per acre in clearcuts.
3. Green tree retention level – average of 5 trees per acre

FY 2001-2003 Sale Plans and Existing Sales

There are 13 timber sales either currently under contract or included in the FY 2001 to 2003 operations plan that will be completed during the implementation plan period. These harvest operations are not included in the goals stated above.

Table 6-19. Summary of Current and Planned Timber Sales as of January 1, 2003.

Sale Plan	Clearcut Acres	Partial Cut Acres
FY 2001*	119	603
FY 2002	81	995
FY 2003	106	969

- The Annual Operations Plans for Fiscal Years 2000 and 2001 were approved prior to the adoption of the Northwest and Southwest Oregon State Forest Management Plans by the Oregon Board of Forestry. These two operation plans also occur prior to the time frame of this implementation plan, although the contracts extend into the implementation period.

Appendix A

Determining Levels of Harvest and Other Silvicultural Activities for Northwest State Forests

This document shows the results and outlines the steps and processes used to arrive at the activity levels in the *West Oregon District Implementation Plan.* Levels for harvest and other silvicultural activities were determined utilizing the Department of Forestry's *Implementation Plans 2001: Determining Levels of Harvest and Other Silvicultural Activities for Northwest State Forest and Procedure for Review and Refinement of Draft IP Harvest Calculations* (ODF, 2001a).

Results

Table 6-20 summarizes the estimated annual objectives for harvests and other silvicultural treatments for the 10-year period from fiscal year 2002 to fiscal year 2011.

Table 6-20. Annual Objectives/Estimates

Silvicultural Activity	Annual Objective Acres / Year
Conifer Partial Cut Harvest	700 – 1,100
Conifer Clearcut Harvest	60 – 80
Hardwood Partial Cut Harvest	0 – 20
Hardwood Clearcut Harvest	10 – 30
Rehabilitation	0 – 100
Reforestation	
Initial Planting	50 - 200
Under Planting	20 - 200
Precommercial Thinning	200 – 800
Fertilization	0
Pruning	0 – 100

Step 1: Allocate the district acreage into broad categories.

The state forest lands on the West Oregon District (37,672 total acres) were divided into the following four categories: roads and streams (including the associated riparian management areas), non-commercial lands, commercial conifer stands, and commercial hardwood stands. The results are shown in Table 6-21.

Table 6-21. Determination of Stands Capable of Supporting a Commercial Operation

Category	Acres
Total District Acres	**37,672**
Roads and Streams	3,606
Non-Commercial	1,180
Commercial Conifer	31, 968
Commercial Hardwood	918

Roads and Streams

The acres in roads and streams were developed using the district GIS (Geographic Information System) databases. The roads were estimated to have an average width of 34 feet (17 feet on either side of the center line), including the ditch, cut slope, and fill slope. Therefore, a 17-foot buffer was placed on either side of the center line of all roads on the district. In addition, the area containing a railroad right-of-way was included in these acres.

The acres in streams and their associated riparian management areas were determined to be the areas in the Land Management Classification System that were classified as special stewardship – aquatic and riparian subclass.

Through several GIS processes, the number of acres in roads and streams were determined for each stand polygon in the forest inventory. The acres in the roads and streams were then subtracted from the gross acres in each polygon in the forest inventory database, and the stands were divided into broad categories based on their use, makeup and productivity. The result was the net acres for non-commercial, commercial conifer, and commercial hardwood land.

Non-Commercial Lands

Non-commercial lands are areas where no commercial operations are expected in the next 30 years. The areas included in the non-commercial class are lands that are non-silviculturally capable, and lands classified as special stewardship. These special stewardship areas include marbled murrelet management areas, BPA powerline rights-of-way, tidal flats, recreation sites and operationally limited lands such as unstable slopes. A road right-of-way (purchased to access state forest lands but not containing any forest land), rock pits, and exposed rock or subsoil from landslides (as mapped in the 1997 landslide inventory) were also included in the non-commercial category.

Commercial Conifer

Commercial conifer stands are all stands classified as conifer by the forest inventory database, unless classed as non-commercial. The conifer classification in the inventory is given to those stands where more than 30 percent of the basal area is comprised of conifers.

Commercial Hardwood

Commercial hardwood stands are all stands that are classified as hardwood by the forest inventory database, unless classed as non-commercial. The hardwood classification is given to those stands where more than 70 percent is comprised of hardwoods. The commercial hardwood class does not include the majority of the hardwood trees or patches on the landscape. There are many individual hardwoods intermixed with commercial conifer stands; some in pure patches of 5 acres or more.

Step 2: Determine long-term annual conifer harvest opportunity.

Steps 2 and 3 determine the long-term harvest opportunity for conifers and hardwoods. Table 6-21 includes all commercial conifer and hardwood forest lands (after deductions for roads and streams) that could support a commercial harvest operation in the next 30 years, without deductions for availability and operability. The conversion/return period is either 15, 25, or 35 years for clearcuts and 12 or 20 years for partial cuts depending on the stand's current condition.

In order to determine the conifer harvest objective (Step 2), the commercial conifer stands were reviewed for their potential to develop and maintain LYR or OFS stands in the next 30 to 70 years. If the stand was a reasonable candidate, it was placed in the partial cut pool (with a few exceptions); if not, it was placed in the clearcut pool. The period 30 to 70 years was chosen because 30 years is the time period defined in the guidance for these calculations as the foreseeable future; and we estimate that it will take 70-80 years for the district forests to meet the desired future condition goals.

Partial Cut

Partial cut harvesting typically begins at 25 to 30 years on the West Oregon District, and has occurred in stands older than 80 years. The return period for partial cutting in these stands generally relates to stand age and stocking. Stands between 25 and 55 years old have a return period of approximately 12 years. The time of this return period can be longer or shorter, depending on the residual density left after the previous harvest. Stands over 55 years will have a return period of about 20 years, again depending on the residual density of the previous operation. Of the approximately 29,000 acres in the partial cut category, 77 percent currently have a 12-year return period. The remainder of the acres have a 20-year return period.

Clearcut

The stands in the clearcut harvest pool are from two sources: those that have severe forest health problems, and those stands that are not reasonable silvicultural candidates for developing LYR or OFS stands.

Forest health — Stands with severe infections of Swiss needle cast or large concentrations of laminated root rot may be clearcut in order to control these diseases. These harvests will follow the recommendations in the *Strategic Plan for Managing State Forests in Northwest Oregon Affected by Swiss Needle Cast* (ODF, January 2000) and *Laminated Root Rot in Western North America* (Thies and Sturrock, 1995).

Approximately 300 to 400 acres of CSC plantations currently have moderate to severe infestations of Swiss needle cast. In the next 10 years the district plans to remove most of the Douglas-fir from these stands, while retaining the disease-resistant species. The distribution and severity of Swiss needle cast has not stabilized, so additional plantations may become infected with this disease and warrant treatment. If this occurs, the clearcut harvest objective for the district could increase.

The treatment for laminated root rot will normally result in patch cuts of less than 5 acres. Treatment of the infection site may occasionally require a small clearcut which is defined as a patch larger than 5 acres. The treatments for laminated root rot will usually be prescribed when a CSC or a UDS stand is being prepared for a partial cut operation. It is only during the sale preparation process that the true extent and location of the laminated root rot infection areas can best be determined. There is no current estimate of the total acres of laminated root rot treatments that will result in clearcuts, so no acres have been incorporated into the district clearcut objective for this purpose. However, it is believed root rot treatments will be only a few acres, and that the treatments can be accomplished within the overall district clearcut objective.

Poor candidates for complex stands — There are three types of stands that are being considered for clearcut harvest because they are not reasonable candidates for creating functioning LYR and OFS stands. These stands are: overly dense CSC stands greater than 55 years old, UDS stands over 70 years old that have fewer than 20 trees per acre that are not Douglas-fir, and LYR stands that have fewer than 20 conifer trees per acre.

Closed single canopy — These overly dense stands have a low potential for developing into functioning LYR or OFS stands. These nearly pure Douglas-fir stands are typically between 55 and 100 years old, with relative densities of greater than 65 percent, and more than 300 trees per acre. These stands are slow growing, have short crowns, and very little vegetation in the understory.

The district already has an over-abundance of the CSC stand structure and expects that REG stands will be growing into this type faster than the existing CSC stands grow out of it into understory stands. Because of this, the district has determined to use a 15-year conversion period on these stands. There are 730 acres in this stand type in the long-term clearcut harvest opportunity pool. This constitutes 5 percent of the stands currently in the CSC stand type.

Understory — The UDS stands that are included in the clearcut pool consist of nearly pure Douglas-fir stands that are over 70 years old, with fewer than 20 non-Douglas-fir trees per acre (usually red alder). These UDS stands are currently meeting their stand structure function. During the next 10 years the district expects to double the number of acres in the UDS stand structure. To capture the economic value of these stands without

compromising the district's desired future condition goals, a conversion period of 25 years was chosen for the UDS stands in the clearcut harvest pool. The long-term clearcut harvest pool contains 1,470 acres of these stands, of which 590 acres may be harvested during the implementation plan period (prior to deductions for availability and operability). The 590 acres represents 10 percent of the stands currently in the UDS stand type.

Layered — In order to capture the economic value of these stands without compromising the district's desired future condition goals (particularly in hardwood stands, since there will be few conifer available for harvest), a conversion period of 35 years was chosen for the LYR stands in the clearcut harvest pool. The long-term clearcut harvest pool contains 720 acres of these stands, of which 210 acres may be harvested during the implementation plan period (prior to deductions for availability and operability). The 210 acres represents 6 percent of the stands currently in the LYR stand type.

Step 3: Determine the long-term annual hardwood harvest opportunity.

The rationale used, and conversion/return period for determining the annual hardwood harvest, are nearly identical to those used for annual conifer harvest opportunity (except these stands have very few conifers, if any). Approximately 95 percent of these stands have fewer than 15 conifer trees per acre, while a full one-third of these stands contain no conifer trees at all. Table 6-21 shows the total acres of commercial hardwood stands in the clearcut and partial cut pools.

Partial Cut

Only 160 of 918 acres of the commercial hardwood stands in the long-term harvest pool contain enough conifer trees to eventually develop into OFS. These 160 acres will be partial cut with the objective to leave the conifer and take most, but not all, of the hardwood in order to develop more complex stand types. After the first entry, they would likely be classed as commercial conifer stands.

Clearcut

The remaining 750 acres of hardwood fall into three categories in the long-term clearcut harvest pool: CSC stands (500 acres); and UDS and LYR stands (250 acres).

The conversion period will be 15 years on CSC hardwood stands, and the hardwood UDS and LYR stands will have 25-year conversion periods. The rationales for these conversion periods are the same as for the conifer stands.

Step 4: Adjust gross harvest objectives for availability factors.

In this step, the availability factors that influence the harvest objectives during the implementation plan period are taken into account. Six factors affecting stand availability were identified on the West Oregon District: buffers for marbled murrelet management areas, northern spotted owl management circles, recent partial cut operations, stands with low stocking, stands too young to partial cut, and stands too young to clearcut. Some of

these factors reduced overall harvest levels for the implementation plan period, while others moved stands from the clearcut pool to the partial cut pool.

Desired Future Condition Complex — These areas have been identified in the district landscape design as important areas to develop LYR and OFS. The district intends to concentrate more complex stand types in these areas, and apply more intensive silvicultural activities to develop these structures. For these calculations, it was assumed that clearcut harvest would not occur in OFS or LYR stands in these areas.

Northern spotted owl management circles — These areas are based on 1.5-mile radius circles around northern spotted owl activity centers. They have been classed as focused stewardship in the Land Management Classification System. Most of these circles overlap the DFCCs. No clearcut harvest will occur in these areas, while partial cuts may be allowed after consultation with wildlife biologists. Stands scheduled for clearcuts in these areas were reallocated to the partial cut pool. UDS and LYR stands were placed in the PC Older group and CSC was placed in the PC young group.

Recent partial cut operations — Stands that have been recently partial cut will not be available for the next entry during the 10-year implementation plan period. Stands in this category include partial cut harvest completed after 1997 and stands currently under contract for partial cut harvest.

Stands with low stocking — For these harvest calculations, it was assumed that the commercial conifer stands with fewer that 50 trees per acres would not support a partial cut harvest. The cost of preparing and administering these sales would exceed the revenues and there would be a limited benefit to stand structure development. Therefore conifer stands scheduled for partial cutting were removed from the available pool. As techniques are developed for partial cutting of hardwoods, some of these stands may become available.

Stands too young to partial cut — These stands are scheduled for partial cut harvest over the long term, but will not reach a merchantable size or age by the end of the implementation plan period. Since the first commercial entry into a stand occurs at an average age of 30 years, any stand 20 years or less in age was removed from the partial cut availability.

Stands too young to clearcut — Since the minimum age for clearcutting hardwoods in this implementation plan is 50 years, any hardwood stand scheduled for clearcutting but less than 50 years old, was removed from the clearcut pool.

Step 5: Adjust gross harvest objectives for operability factors.

The operability factors that influence the harvest objectives are taken into account in this step. The harvest objectives on the West Oregon District are influenced by two factors: access to the unit and size of the unit

Access — This includes stands that are in the clearcut and partial cut pools, but cannot be accessed because other stands that are not available for harvest are blocking the operation. Many of the stands available for clearcut harvest will require the harvest of small portions of UDS or LYR stands in order to design a harvest unit that is feasible from an

engineering, economic, and safety aspect. However, harvesting some available stands would require the removal of unacceptable amounts of the more complex stand types. Those stands are removed from the harvest availability pool.

Size — These stands are in the clearcut and partial cut pools, but are generally too small and/or too far from other stands available for harvest to produce an economically feasible harvest operation.

Step 6: Adjust gross harvest objectives for logistical factors.

No adjustments were made to the gross harvest objectives for logistical factors.

Table 6-22. Summary of Availability, Operability, and Logistical Reduction Factors

Harvest Objective	Gross Annual Objectives (Acres)	Availability Reduction (Acres)	Operability Reduction (Acres)	Logistical Reduction (Acres)	Net Annual Objectives (Acres)
Conifer Clearcut	139	69 (49%)	4 (3%)	0	66
Hardwood Clearcut	42	23 (55%)	0	0	19
Conifer Partial Cutting	2,187	1159 (53%)	139 (6%)	0	889
Hardwood Partial Cutting	15	0	8 (53%)	0	7

Harvest Objectives After All Adjustments

Implementation plan harvest objectives are shown in Table 6-22 above. These objectives start with acres that are available for partial cut and clearcut harvest in the foreseeable future (approximately 30 years), then adjust the acres for the various factors as discussed above. The last row on the table shows the annual clearcut and partial cut objectives.

The annual clearcut objective for the district is 85 acres. However, it will vary between 70 and 110 acres per year.

The annual conifer clearcut objective is composed of 23 percent Swiss needle cast stands and 42 percent CSC stands. The remaining 35 percent of the objective is composed of UDS and LYR stands that are not reasonable silvicultural candidates for creating and maintaining LYR and OFS stands.

Approximately 66 percent of the annual hardwood clearcut objective (13 acres) is composed of CSC stands with very few conifer, if any. The remaining 34 percent (6 acres) of the objective is composed of the hardwood UDS and LYR stands in which the hardwoods are coming to the end of their life spans.

A total of 230 acres of UDS and 78 acres of LYR stands may be clearcut during the implementation plan period. This represents 4 percent of the UDS and 2 percent of the LYR stands on the district.

The annual partial cut objective of 896 acres per year is largely composed of conifer stands between the ages of 25 and 55 years. These stands account for 67 percent of the partial cut objective. The remainder is composed of conifer stands over 55 years old and an insignificant amount of hardwood stands (8 acres per year).

Step 7. Estimate the annual rehabilitation acreage.

The district has currently identified up to 400 acres that are dominated by brush species and considered to be underproductive. These acres will require an investment to control existing vegetation, prepare the site for planting, and establish a new stand of trees. Up to 100 of these acres will be rehabilitated in the planning period.

Step 8. Estimate the annual reforestation acreage.

The reforestation acreage includes estimated initial and interplanting of clearcuts and underplanting of partial cuts.

Initial planting and interplanting — The current sold timber sales with clearcuts will keep the district's reforestation acreage slightly higher than the long-term level. This level is predicted to last through fiscal year 2002, after which planned harvest levels should keep the average reforestation acres between 50 and 200 acres per year. Acres of interplanting have been very low in recent years and should remain that way barring unforeseen events (weather events or severe animal damage, for example) which would necessitate increased levels of interplanting.

Underplanting — Underplanting is considered to be one of the most important ways of creating LYR and OFS stands. It is also a primary technique for increasing conifer species diversity in a stand. Underplanting consists of planting small patches in existing stands or planting under widely thinned stands. Funding and timber sale harvest timing can affect how much underplanting will be done in any given year. The annual acreage for underplanting is estimated to be between 20 and 200 acres.

Step 9. Determine the annual precommercial thinning estimate.

Due to the necessity of precommercial thinning (PCT) to maintain vigorous young stands, current PCT levels should not fall to zero, although they may fluctuate. The estimated annual acreage of PCT for the next 10 years ranges from 200 to 800 acres per year. Current budget constraints will keep acreage at the lower level. As funding becomes available, the annual PCT acreage will stay at, or near, the upper acreage range for the duration of the planning period. This is a direct reflection on past harvesting levels conducted on the district during the early to mid-1980s.

Step 10. Determine the annual fertilization and pruning estimates.

Fertilization Estimate

No Fertilization is planned for the implementation plan period.

Pruning Estimate

Since pruning is normally completed in three entries over a five to six-year period, the number of acres pruned per year will fluctuate within the stated range. The range in completed acres of pruning is the result of an uneven distribution in stand ages and labor available. These pruning activities are primarily geared toward the completion of pruning (second and third entries) on stands that have had some initial pruning work. Additional pruning may take place in areas planted with western white pine to help combat disease problems specific to the species. This type of pruning activity would make up a nominal portion of the annual acreage planned. Up to 100 acres per year may be pruned.

Step 11. Adjust estimates for logistical, operability, and availability factors.

The other silvicultural activities did not need to be further adjusted; these reductions were included above.

Appendix B

References

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Map Section

1. **West Oregon District Overview**
2. **West Oregon District: Current Condition Stand Structure**
3. **West Oregon District: Desired Future Condition Stand Structure**