



# Tillamook District

## Draft Implementation Plan

*March 2009*

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# Introduction

The *Tillamook District Implementation Plan* guides forest management for all forest resources on the Tillamook District beginning July 1, 2009 through June 30, 2019. This implementation plan is a major revision of the plan approved by the State Forester in March, 2003. The reasons for the revision include:

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

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

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

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

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

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

- Out dated definitions are removed from the Roads sections under the Human Uses and Proposed Management Activities sections

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

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## District Overview

### Land Ownership

The Tillamook District is located on the west slopes of the Coast Range and is comprised of 250,601 acres. The Oregon Department of Forestry (ODF) also manages 1,743 acres of Tillamook County lands under an agreement with the county.

Additional state forest lands are adjacent to the district on two sides, with Astoria District to the north and Forest Grove District to the east. Other adjacent forest landowners include private industrial and non-industrial landowners, the U.S. Forest Service (USFS), Oregon Parks and Recreation Department (OPRD), Oregon Department of Fish and Wildlife, and the Bureau of Land Management (BLM).

**Table 1. Tillamook District Acres, by County**

<b>County</b>	<b>Board of Forestry Land (acres)</b>	<b>Common School Land (acres)</b>	<b>County-Owned Land</b>	<b>Total (acres)</b>
Tillamook	241,828	5,035	1,743	248,606
Clatsop	2,417	0	0	2,417
Washington	1,182	0	0	1,182
Yamhill	139	0	0	139
<b>Total</b>	<b>245,566</b>	<b>5,035</b>	<b>1,743</b>	<b>252,344</b>

## **Forest Land Management Classification System**

Below are tables summarizing the Tillamook District Forest Land Management Classification System (FLMC). The FLMC has been implemented in accordance with OAR 629-350-005-, an administrative rule on state forest management adopted by the Board of Forestry in 1998.

The FLMC is a method of describing the management emphasis of parcels of state forest land. The management emphasis identifies the extent to which a parcel of land can be managed for a variety of forest resources. It also identifies when a particular forest resource may need a more focused approach in its management, or possibly an exclusive priority in its management. The framework of the FLMC places all state forest land within one of three land management classifications. The classifications are: (1) General Stewardship, (2) Focused Stewardship, and (3) Special Stewardship. Subclasses are assigned for the specific forest resources that require a Focused Stewardship or Special Stewardship Classification.

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

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

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

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

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

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

**Table 2. Tillamook District Acres, by Stewardship Class**

<b>Classification</b>	<b>BOF</b>	<b>CSL</b>	<b>County Owned Land</b>	<b>Total Acres</b>
Special Stewardship	84,024	3,240	1,752	89,016
Focused Stewardship	260,310	5,657	4,200	270,167
General Stewardship	42,589	642	0	43,231

**Table 3. Tillamook District Acres, by Focused and Special Stewardship Subclasses**

	<b>Focused</b>	<b>Special</b>
Administrative Sites	0	6
Aquatic and Riparian Habitat	11,6334	20,361
Cultural Resources	288	0
Deeds	3,099	1,856
Domestic Water Use	1,851	0
Easements	1,743	0
Energy and Minerals	0	0
Operationally Limited	N/A	34,402
Plants	0	65
Recreation	6,615	1,850
Research/Monitoring	4,989	0
Transmission	0	969
Visual	35,290	369
Wildlife Habitat	99,058	29,138

# History

The Tillamook State Forest and Tillamook District were created in the mid-1960s while the Tillamook Burn was reforested. The Tillamook Burn was a series of catastrophic fires in 1933, 1939, 1945, and 1951 that burned over 350,000 acres. Before 1933, private timber companies owned most of the forested land in Tillamook County and railroad logging was the most common forest activity on these lands. After the 1933 fire, ownership of most of the burned land was transferred to the county for delinquent property tax payments. Forest activity focused on salvage logging over the next couple of decades. In the 1940s and early 1950s, the county deeded the lands to the state of Oregon for management, and reforestation began.

Due to intensive reforestation work in the 1950s, 1960s, and early 1970s, the district is dominated by dense Douglas-fir stands resulting from hand-planting and aerial seeding. The forest is dominated by Understory (UDS) conifer and hardwood stands 35 to 55 years old. Throughout the forest, riparian areas are dominated by hardwood species, especially next to perennial streams.

Early state forest harvest plans were based on the sustained yield calculations with planned rotation ages. There were limited opportunities for timber harvest because most of the forest was well below the rotation age of 60 years or more. For most of the forest, management focused on interplanting or replanting Douglas-fir, controlling competing species such as alder, and precommercial thinning. Older stands (more than 70 years old) were present on approximately 60,000 acres (24 percent) along the district's western edge, and harvesting has been concentrated in these stands over the past 40 years.

Partial cutting was the primary focus for harvesting between 1992 and 2002. Partial cutting still is an important management tool to control stand density and to move stands more quickly to complex stand structures. Management emphasis changed in the 2003 implementation plan to focus on clearcutting Douglas-fir stands severely impacted by Swiss needle cast (SNC). Approximately 24,000 acres of SNC Douglas-fir has been harvested. Douglas-fir stands are continually being evaluated for the affects of SNC by their overall growth and vigor (height and diameter growth, percent of live crown, and needle retention) rather than their location on the district (moderate or severe SNC zones).

# Physical Elements

## *Geology and Soils*

The Tillamook District is located in the northern Oregon Coast Range. The rocks in this part of the Coast Range were generally formed by volcanic eruptions associated with the creation of an offshore volcanic island chain and by deposition of sediments in the surrounding shallow seas. These rocks have since been accreted to the continent, uplifted, and eroded to form the rugged topography of the current-day Coast Range. The predominant rock types on the district are diabase sills and dikes (intrusive igneous rocks), basalt flows and breccias and tuffs of the Tillamook Volcanics and Siletz River Volcanics (extrusive igneous rocks), and marine mudstones and siltstones and sandstones (sedimentary rocks). The rocks are

mostly Eocene in age and were formed 35 to 55 million years ago. They have experienced significant amounts of folding and faulting since then due to tectonic activity.

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

1. Shallow landslides

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

2. Deep-seated landslides

- typically at least 10 feet deep and up to 100's of acres in size
- primarily occur on gentle to moderate slopes, often with deep soils
- movement is usually slow (inches a day) and intermittent with years going by in between episodes of movement
- many are ancient features that have not experienced movement for hundreds or thousands of years and are relatively stable
- debris flows can occur on the margins of these landslides, especially where there are critical slope breaks with steeper topography and/or confined channels below
- are often identifiable on soil, geologic, and topographic maps and movement is often a reactivation of a pre-existing landslide feature, however movement may still be hard to predict at a site-specific level

Both types of landslide hazards are common on the Tillamook District and significantly affect operations on the district. The district has the greatest concentration of steep slopes and topographic relief in the northern half of the Coast Range. This combined with the dense network of incised stream channels makes the district prone to debris flows.

The dominant soil associations within the Tillamook District include Rye, Killam, and Jewell (ODF, 1978). The majority of these are well-drained, colluvial soils with site indexes ranging from 100 (low Site III) to 120 (low Site II). Some of the higher elevation soils have high rock content and exhibit poorer productivity (80 - Low Site IV). (ODF Soil Survey, 1978).

Soils underlain by sedimentary rock formations are generally moderately deep colluvium, and are well drained. Textures range from fine sandy loams and silt loams to silty clay loams. The volcanic uplands underlain by igneous rock formations are comprised of soils that are generally moderately deep to shallow, well-drained colluvium. Textures range from gravely to very rocky silt loams and loams. Rock outcrops are abundant. Inherent site index ranges from low to high, but fire effects have potentially diminished productivity to some

degree as nutrients were volatilized. Post-fire surface erosion contributed to additional losses in productivity. Site productivity is believed to have recovered to some degree from adverse fire impacts and post-burn surface erosion.

## ***Topography***

The majority of the district lies on steep, incised, mountainous terrain on the western flanks of the Coast Range. Elevation ranges from sea level along the coast to over 3,200 feet on Triangulation Point. Approximately 32% of the district is below 1000 feet, 53% lies between 1000 and 2000 feet, 14% lies between 2000 and 3000 feet, and less than 1% is above 3000 feet. The district is dominated by moderate to steep slopes. Approximately 18% of the district has slopes less than 30 percent, 39% has slopes between 30 and 60 percent and 43% has slopes over 60 percent.

## ***Water***

Nine of the district's major watersheds drain into three bays along the Pacific Ocean. The North Fork of the Nehalem River and Lower Nehalem River flow into Nehalem Bay. The Miami, Kilchis, Wilson, Tillamook and Trask rivers flow directly into Tillamook Bay. At the southern end of the district, the Nestucca and Little Nestucca rivers flow into Nestucca Bay. The Short Sands watershed drains into the ocean. The Tillamook Bay basin drains into Tillamook Bay and includes smaller fish-bearing streams and the lower reaches of Miami, Kilchis and Wilson Rivers.

Domestic and municipal water systems exist throughout the forest. The presences of domestic water systems are noted in individual basin **Key Resource descriptions** and have been mapped and updated in the FLMC. ODF has developed a process to work through Oregon Water Resources Department (OWRD), using their website and local office, to access the most current information for identification of domestic water systems when reviewing planned timber sales, which allows for protection of these sites according to Forest Practices Act standards and Forest Management Plan guidelines. Municipal water systems are located in the Kilchis, Miami, and Tillamook River basins.

## ***Climate***

The entire district is on the west slope of the Coast Range and is characterized by a mild climate. Summer temperatures are cooler than the temperatures farther inland, and much of the district is influenced by coastal fog, which generally extends from the ocean to approximately fifteen miles inland. Winters have mild temperatures and large amounts of rain. Intense winter storms occur periodically, and have high winds and heavy precipitation. The high winds can cause significant amounts of windthrow, and the heavy precipitation can trigger landslides. Snow falls at the high elevations during the winter, but often melts quickly with the warm rain typical of Pacific winter storms.

## **Natural Disturbances**

Natural disturbances such as wildfire, windstorms, floods, landslides, and insect and disease outbreaks have influenced and will continue to influence the forest condition. These disturbances often result in increased forest diversity and complexity. Swiss needle cast, windstorms, and landslides are the most common of these disturbances in the Tillamook District. Forest management will reduce the impact of epidemic natural disturbances, but endemic levels will continue to result in increased forest diversity and complexity.

## **Biological Elements**

### **Vegetation**

The majority of the forest has dense Douglas-fir stands that resulted from planting and aerial seeding of the Tillamook Burn, mixed with naturally regenerated hardwoods. The oldest stands are on the western edge outside the Burn. Mixed stands of Douglas-fir and hemlock are also found scattered throughout the district. Hardwood trees dominate riparian areas and are found in some upland areas. The most prominent understory brush and shrub vegetation that occurs on the district is sword fern, salmonberry, and vine maple.

ODF, in partnership with the Tillamook Estuary Partnership (TEP), is mapping, treating, and monitoring knotweed in the Wilson, Little North Fork Wilson, Trask, Kilchis, and Miami Rivers. Other invasive species such as Himalayan blackberry, scotch broom, English ivy and false brome are also targeted for treatment. ODF is in partnership with the six Cooperative Weed Management Areas (CWMA's) within the Northwest Weed Management Partnership. Tillamook District falls within the North Coast CWMA. Tillamook County Soil and Water Conservation District tracks the spread of noxious weeds within the county. Tillamook District Invasive Plant Management plans will address invasive species on ODF lands. See the **Plants** section for more information. Management and control of invasive weeds is described under **Proposed Management Activities**.

### **Forest Health**

There are several forest health concerns on the Tillamook District. The biggest concern is SNC infection in Douglas-fir. Another is the long-term health and vigor of stands that originated from off-site seed sources and the potential compounding effect of soil degradation from multiple burns. Other forest health concerns are *Phellinus weirii*, a root rot and an insect called tip weevil.

### **Swiss Needle Cast**

In recent years SNC, a native fungus infection on Douglas-fir, increased significantly in western Oregon. This disease currently affects much of the Tillamook District. Based on aerial surveys completed annually since 1996, the estimate of infection on the district has ranged from 10,000 acres to 100,000 acres. Since these flights have varied widely in acres, a standard of combining the last three years of aerial surveys is used for analysis.

Strategies for the management of Swiss needle cast Douglas-fir stands is described in the *ODF State Forest Program Strategic Plan for Managing State Forests in Northwest Oregon*

*Affected by Swiss Needle Cast* (2003). In May 2005, Tillamook district personnel and Salem staff reviewed recently completed Swiss needle cast (SNC) studies and their implication to the management of SNC infected stands. The recommendations are documented in *Oregon Department of Forestry State Forest Program, Swiss Needle Cast and Commercial Thinning (May 2005)*. Swiss needle cast severity is variable, within a stand and from stand to stand across the district. Symptoms do not always reflect the level and severity of the SNC infection. Therefore, management of Douglas-fir stands requires an evaluation of growth on a stand by stand basis. See **Management Activities in Each Stand Type** for management strategies for SNC infected stands.

### **Off-Site Seed Source**

Much of the Tillamook Burn was reforested with off-site seed and seedlings; sources ranged from the Puget Sound lowlands to the west slope of the Cascades. It is not yet clear what the long-term effects of the off-site seed source will be on stand development. Many of the records with the seed source information have been lost or destroyed. Poor health or vigor may cause some stands on a Layered or Older Forest Structure pathway to be harvested early. The off-site seed sources combined with SNC may increase the detrimental effects of both situations, and may exacerbate growth reductions. One consequence of this decreased growth is that complex stand development may take longer.

### **Phellinus weirii**

The root rot infections affect 5 to 10 percent of the forest, and vary in magnitude from isolated trees to several acres. The disease is generally concentrated on the eastern portion of the district, and will be dealt with on a site by site basis.

### **Spruce tip weevil**

Another low level or minor concern is tip weevil (*Pissodes strobi*). This insect periodically kills the upper two years of growth on spruce trees that are 5 to 50 feet in height, forcing the tree to produce a new leader. This results in short trees with multiple tops and deformed growth. Mature spruce trees do not seem as susceptible to tip weevil as younger trees. Some reforestation success occurs where spruce grows under other trees like alder or as a second cohort in conifer stands. There is on-going research for management implications of the tip weevil damage.

## ***Fish and Wildlife Resources***

The forest contains many indigenous mammal, bird, reptile, and amphibian wildlife species, including elk, deer, spotted owls, marbled murrelets, black bears, and cougars. Over much of the forest, habitat is currently dominated by dense single-species stands that do not allow sunlight to reach the forest floor, resulting in limited available forage. Recent commercial thinnings and clearcuts have opened up many stands and increased forage. Elk populations in large portions of the forest are at or above management objectives.

Threatened and Endangered (T&E) wildlife species on the district are marbled murrelets, northern spotted owls (NSO), and bald eagles. Marbled murrelet management areas

(MMA) have been identified across the district, encompassing over 4,947 acres. A NSO cluster (Kilchis Cluster) has been designated in the Kilchis basin, and includes small portions of the lower Wilson and Trask basins totaling 8,171 acres. The cluster is adjacent to a BLM Reserve Pair Area (RPA) which has a resident single female in the Wilson River basin. At this time the district has a total of three pairs, one each in the Nestucca, Lower Nehalem, and the Miami basins, and another pair – Status Unknown in the Miami. Single owls have been found on state forest land in several basins over the past eight years. Owl sites are presently located on BLM, USFS, and Oregon Department of Parks and Recreation (OPRD) ownerships and influence management decisions on adjacent state forests. As the proposed HCP is developed, ODF will continue to protect and enhance habitat in conjunction with the current HCP strategies and Endangered Species Act regulations. The protection measures for these species are described in the *State Forest Program Operation Policies for: Marbled Murrelets (2005); Northern Spotted Owls (2008)*, and the *Agreement for the Conservation of Northern Spotted Owls (2001)* (between ODF and the U.S. Fish and Wildlife Service).

The Tillamook District has over 573 miles of fish-bearing streams. Some of these streams have important populations of native salmonids. Anadromous runs on the district include coho, chum, spring and fall Chinook salmon, summer and winter steelhead, and sea-run cutthroat trout. Resident cutthroat trout populations are also found in the district's streams. Coho are listed as threatened under the federal Endangered Species Act. Chum salmon are listed as a critical sensitive species under the *ODF&W Sensitive Species List (2008)*. Chinook populations are classified as healthy in rest of the district's streams. ODF will complete action items found in the *Oregon Plan for Salmon and Watersheds (1999)* to continue protection and enhancement of riparian habitat, as well as improve fish passage and instream habitat through consultation with the Oregon Department of Fish and Wildlife (ODFW). Protection measures for listed fish species are described in the *State Forests Salmon Protection Policy (2001)*. Salmon Anchor Habitats (SAH) are designated in the North Fork Nehalem, Lower Nehalem, Miami, Kilchis, Wilson and Trask basins. These SAHs incorporate approximately 95,917 acres (38%) of the Tillamook District.

See **Salmon Anchor Habitats** document at

[http://egov.oregon.gov/ODF/STATE\\_FORESTS/docs/management/IP/13\\_SAH\\_and\\_App\\_A.pdf](http://egov.oregon.gov/ODF/STATE_FORESTS/docs/management/IP/13_SAH_and_App_A.pdf) for more specific information on salmon strategies.

## **Watershed Condition**

There are three established watershed councils that cover the Tillamook District. The Department of Forestry participates in watershed councils at two levels. The first level provides technical assistance and support to councils by providing data on the forest and technical input on forestry issues. The second level involves being an active council member where the Department of Forestry is a major landowner in the watershed, for example Tillamook Bay and Lower Nehalem Watershed Councils.

Watershed councils have completed watershed assessments for the Nehalem, Miami, Wilson, Trask, Nestucca, and Little Nestucca basins. *Tillamook Bay National Estuary's*

*Comprehensive Conservation and Management Plan for Tillamook Bay, Oregon* (1999) included an analysis of the Kilchis basin and lands within Tillamook Bay basin.

Three recent watershed analyses have been conducted on the Tillamook District by the State Forest Division: Trask, Miami, and Wilson Watersheds. These watershed analyses cover 133,289 acres on Tillamook District, or roughly 56% of the district. An action plan has been prepared to address findings in the Miami watershed analysis. This may be accessed at [http://www.oregon.gov/ODF/STATE\\_FORESTS/docs/Watershed/Miami\\_watershed\\_analysis\\_action\\_plan.pdf](http://www.oregon.gov/ODF/STATE_FORESTS/docs/Watershed/Miami_watershed_analysis_action_plan.pdf). The Wilson action plan is still being prepared.

The district's watersheds are typified by rugged, steep topography. This lends itself to high gradient streams with abundant riffles, which are favored by steelhead trout. Thus, a high proportion of streams (30% by length) provide habitat with high intrinsic potential for steelhead. Conversely, the district has a low proportion of streams (3%) with high intrinsic potential for coho winter rearing.

The watersheds are considered to be managed well. Most current negative conditions are considered to be the result of prior management practices.

Priority actions include the following:

- Consider local potential to improve coho habitat: The Elkhorn sub-watershed (Trask management basin) has the greatest potential for improvement. Small areas of high improvement potential are distributed elsewhere.
- Augment key pieces of instream wood: Most management basins were extensively deficient in key pieces, with the exception of the Little North Fork Wilson and Middle Wilson/Cedar Creek sub-watersheds (Wilson management basin).
- Improve near-term wood recruitment potential: Current wood recruitment potential is low in all management basins.
- Improve long-term (50-100 year) wood recruitment potential by addressing hardwood senescence: This is an issue in all management basins. The Little North Fork Wilson and Middle Wilson watersheds were specifically modeled as having long-term senescence issues.
- Reduce road hydrologic connection: This was highest in the Miami and Kilchis management basins.
- Reduce stream crossings blocking fish passage. The highest proportion of stream crossings blocking passage was in the Miami management basin.

## **Human Uses**

### ***Forest Management***

The Tillamook District has been operating under the Tillamook District Implementation Plan, approved in March of 2003. Table 4 shows the current annual objectives of silvicultural management activities as well as the eight-year average of acres accomplished.

The Current Level column refers to the 2010 Annual Operations Plan which will be planned according to the revised Tillamook District Implementation Plan, approved in June of 2009.

**Table 4. Silvicultural Management Activities**

<b>Activity</b>	<b>2010 AOP <sup>2</sup> (Acres Per Year)</b>	<b>Eight-Year Average (Acres Per Year)</b>
Regeneration Harvest <sup>1</sup>	2,146	3,524
Partial Cut	1,112	1,793
Reforestation	3,329	2,240
Precommercial Thinning	400 <sup>3</sup>	341
Fertilization	0 <sup>4</sup>	0

1. Under Oregon Department of Forestry management, this refers to a regeneration harvest (modified clearcut or retention cut) that removes most trees, but leaves specified numbers of green trees, snags, and down wood to provide structure (habitat) in the new stand.
2. Current harvest levels are taken from the Tillamook District draft annual harvest plan, for year.
3. Customary annual objectives of 300-500 acres of Precommercial Thinning have been eliminated or deferred due to budget constraints for FY 2010.
4. Fertilization is not anticipated to be used during this IP because of the negative impact to SNC infected stands.

## **Roads**

The district's road system consists of mostly collectors and spur roads with a few under-standard roads, which total 1,041 miles of mostly single-lane forest roads with turnouts. The district's primary road network is an established system that has been in place for 40 to 50 years. It provides access for forest management activities, fire suppression, and public travel. Visions, guiding principles, and goals for managing the districts road network are discussed in the *Northwest Oregon State Forests Management Plan* (January 2001) and the *Forest Roads Manual* (July 2000). The *Forest Roads Manual* also provides standards and definitions for road classifications and other terms.

Many of the district's main roads (collectors) were originally built as railroads and then converted to truck roads in the 1940s and 1950s, to standards considerably less stringent than those applied today. Many of these roads were constructed with inadequate drainage systems, poor surfacing, and little regard for slope stability and fish passage.

Most of these roads have been upgraded and now have improved drainage structures, rock surfacing, width, and alignment. There are still legacy roads from those earlier decades that need improvement, access restriction, or vacating. There are also significant areas in the forest with inadequate access.

**Table 5. Tillamook District Road System<sup>1</sup>**

<b>Road Classification</b>	<b>Miles</b>
Mainline	80
Collector	474
Spur	487
<b>Total Miles</b>	<b>1,041</b>

New information has been gathered about current road conditions and environmental risk with the Miami and Wilson watershed analyses, and road surveys for the East Fork Trask and Kilchis watershed (about 60 percent of the district’s road miles). The information is being used to help identify areas of concern, prioritize needed repairs, and plan road management activities. In addition, District personnel are working to create a State Forests road information management data base. Additional road information will be collected after this system is completed and tested (during this IP period).

Nearly 81 percent of the district’s road miles are surfaced with rock. The type of surfacing is split between old rock (usually this is natural quarry or pit run rock) and new, crushed rock. Additional crushed rock will be applied to roads, particularly those surfaced with old rock, as part of the district’s ongoing work to upgrade roads.

Roads cross known fish-bearing streams in 141 locations. Bridges are used for 86 crossings and culverts are used for the other 55 crossings. Thirty-four culverts allow fish to move upstream and downstream. The remaining 19 culverts block upstream movement of all fish and 3 block upstream movement of adult fish. The district has not completed fish presence surveys on all streams on state forest land, and there are a number of culverts on streams where fish presence has not been determined. Once the fish presence surveys are completed, the culverts can be evaluated for fish passage.

Hydrologic connectivity measures the proportion of overall road length that drains to streams versus draining to and infiltration into the forest floor. Hydrologic connectivity for the Miami watershed was 20 percent and for the Wilson watershed was 16 percent. This is very close to the State Forests performance measure of 15 percent. Road improvements during this IP period are expected to have road systems meet the hydrologic connectivity target over the District.

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

### **Recreation**

The district offers a variety of recreation resources and opportunities, including five major river corridors, an extensive road system, trails for motorized and non-motorized use, dispersed camping sites, campgrounds, remote areas, scenic vistas, and historic sites.

In general, recreation use is increasing across the district. The forest is accessed by Highway 6, which bisects the district and provides direct access from the Portland metropolitan area and by Highway 101, which extends along the western edge of the district and provides access for coastal based visitors. Highway 6 accesses the heart of the Wilson River Basin which contains most of the developed recreation sites and trails and the Tillamook Forest Center, a forest and history interpretative site. There are now three developed fee campgrounds with day use areas, and a developed OHV staging area with overnight fee camping.

The Tillamook District is popular among off-highway vehicle (OHV) enthusiasts. OHV use continues to be the most popular year-round recreation activity. Hiking, mountain biking and equestrian uses are increasing, as new trails are constructed and old ones rehabilitated. On the district, there are over 40 miles of trail designated for horse, hiker, and mountain bike use in addition to the 190 miles designated exclusively as OHV trail. The Wilson River basin and the Trask River Basin have the heaviest OHV use and the majority of the designated OHV trails (180 miles) on the district.

Day use activities include picnicking and swimming in the summer, and kayaking in the spring and fall. Dispersed camping continues to be popular and is concentrated along rivers and streams such as Cedar Creek, Cook Creek, and the Wilson River. Fishing and hunting are also popular throughout the forest. In general, the district's recreation use is seasonal with most activity occurring in the late spring, summer, and fall, but more use is occurring district-wide and all year round.

## **Scenic**

The Tillamook District has scenic viewsheds from urban areas, highways, county roads, and Tillamook Bay. State Highways 6 and 101 both have scenic ratings of 1, the highest sensitivity rating. Over 23,000 acres of state forest land are visible from the Highway 6 corridor, and approximately 8,200 acres are visible from Highway 101.

The communities of Tillamook, Bay City, and Garibaldi have views of state forest land. A unique viewshed is Tillamook Bay itself, which is used by anglers and recreational boaters who can see State Forest lands from their watercraft on the bay. The slopes and ridges above Bay City and Garibaldi are visible from the bay, and include much of the acreage visible from Highway 101 mentioned above.

## **Forest Stand Structure: Current Condition**

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

The current condition stand structures were determined by the structure algorithm used in conjunction with the Stand Level Inventory (SLI). The Structure Algorithm is based on stand type descriptions found in the *Northwest Oregon State Forests Management Plan*,

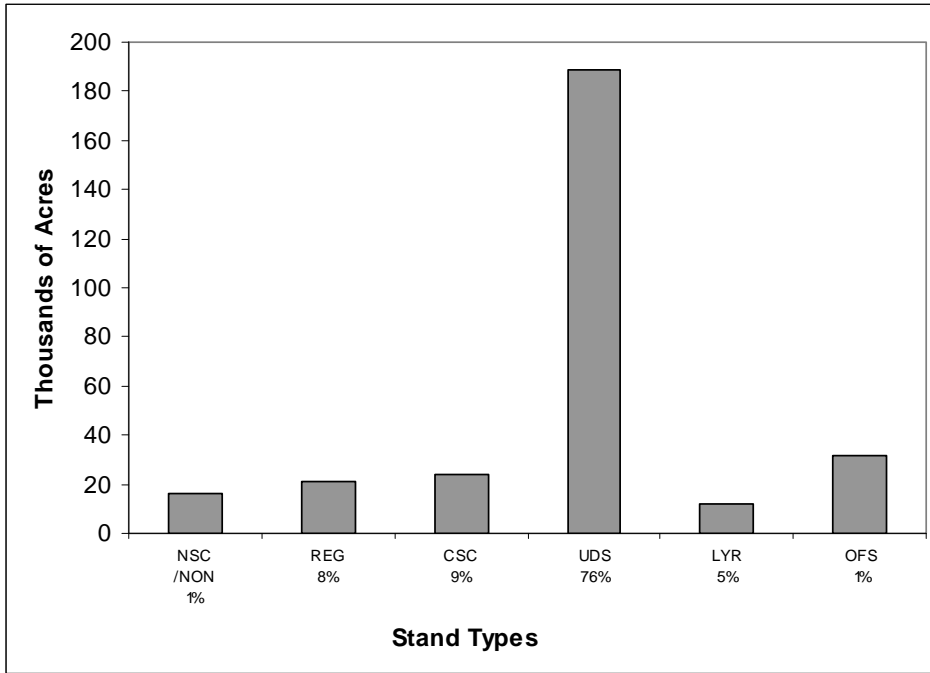
Appendix C, (pages C-2 to C-15). When differences are found after stands had been visited on the ground, that information is incorporated and the stand structure can be adjusted.

Figure 2 shows the current age distribution of the forest, regardless of stand type, by acreage and percentage.

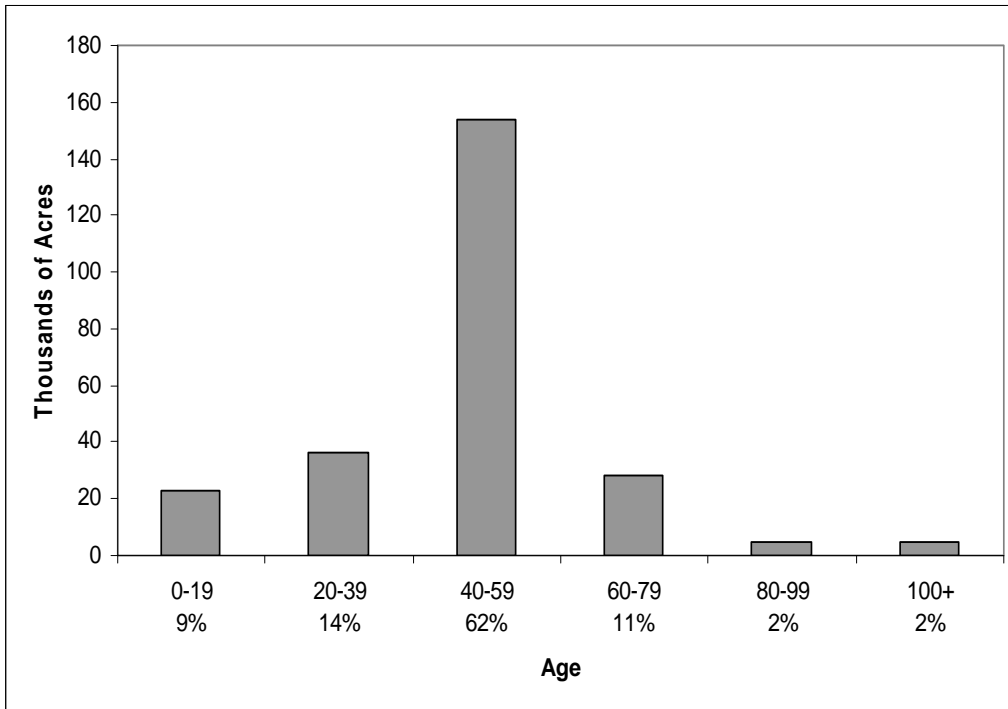
**Abbreviations for Forest Stand Types**

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

**Figure 1. Current Stand Structure, by Acres and Percent**



**Figure 2. Stand Age Distribution by Acres and Percent**



## Management Activities

### Current Condition Analysis

Most forest lands in the Tillamook District were either logged in the early to mid-twentieth century or burned in the many fires on the district, between 1933-1951, and then allowed to revert to county ownership due to non-payment of taxes. The county eventually deeded these lands to the state. The fires of the Tillamook Burns engulfed 80% of the Tillamook District, some areas being burned two and three times. The burned or logged areas were usually reforested by natural regeneration from adjacent stands or residual trees. This was the case in the portion of the district north of the Nehalem River and along the western edge of the district. The remaining land did not have seed sources and remained in a non-forest condition until the rehabilitation efforts of the 1950s.

During the 1950s a large effort was undertaken to replant the Tillamook Burn. There wasn't enough local seed for this amount of acres so seed was collected from like areas around the Pacific Northwest. Starting in the 1950s, parts of the "Burn" were aerially seeded because the land was inaccessible to vehicles, and the remainder was planted from late 1950's through the mid 1970's. In the late 1970's a large aerial spray project, targeting tens-of-thousands of acres, was undertaken to release the planted and seeded Douglas-fir trees from competing red alder. The spray succeeded in releasing the Douglas-fir although it didn't kill the alder. It only killed the tops at varying heights, which resulted in the alder resprouting

with multiple tops from boles that vary from 12 to 30 feet in height. The merchantability of this alder depends on amount and location of the spray damage. Currently, about 28 percent of the Tillamook District lands are hardwood or mixed hardwood stands and conifer stands (70,600 acres), with the hardwoods being of varied merchantability and quality.

In the early 1990s the district became aware of a problem with stand growth and needle retention in young plantations on the west edge of the district. Swiss needle cast (SNC), a native fungus infection of Douglas-fir, had increased significantly and was causing growth stagnation in plantations. By the mid 1990 the SNC symptoms had spread eastward to older stands. This prompted the Board of Forestry to direct an increase in harvest to aggressively remove the severely infected SNC plantations which was reflected in the harvest levels of the previous Implementation Plan (2003). See **Forest Health** for more information on the health and condition of the current stands.

Approximately 14 % of the district is designated as non-operational or not available due to topography and/or soil conditions.

### ***Stand Structure Interaction***

The Current Condition Analysis and 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 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.

The table below compares these three patch types to the five stand types described in the forest management plan.

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<b>Comparison between</b>	
<b>Landscape Patch Types and Stand Types</b>	
<b>Landscape Patch</b>	<b>Stand Type</b>
Young Forest	Regeneration through closed single canopy sapling stands
Pole-Sized Forest	Closed single canopy pole-sized through layered stands
Mature Forest	Closed single canopy, understory, layered, and older forest structure stands (trees larger than pole-sized)

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As you examine the current and desired future conditions described by the stand types, it is important to think about the combinations and aggregations of different stand types that function together to provide the benefits 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 arrangement 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 the blueprint of a desirable array 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 stands to provide habitat patches that represent mature forests to wildlife species. The result being that significantly more acres of mature forest habitat are available for wildlife than any single stand type represents.

### ***Regeneration***

At this time the district contains about 8 percent REG structure. This structure is primarily characterized by young (less than or equal to 15 years) even-aged stands of mixed conifer and a component of naturally regenerated hardwood seedlings and saplings. The older plantations resulted of from clearcut prescriptions from the early 1990's, which many times did not leave previous stand components like snags, down-wood, or green tree retention. Until the late 1990's stands were reforested with a single species (Douglas-fir), creating stands which are very simple and most are moderately to severely impacted by SNC. Many of the Douglas-fir stands between ten and fifteen years of age have been interplanted with hemlock. However, this structure type has evolved as management strategies and techniques have evolved. Presently, it is not uncommon to find mature live trees, snags, and down wood intermixed throughout this structure. This structure type is widely used by big game animals for foraging habitat.

### ***Closed Single Canopy***

Many CSC stands, (approximately 9 percent of the district), are a result of the reforestation of the Tillamook Burn. Most are dense stands of Douglas-fir, or a mix of conifer and hardwood dominated by Douglas-fir. Some stands naturally regenerated with hemlock as the dominant component. These hemlock stands are generally located along the west edge of the district and are dense tall stands with high height to diameter ratios. Mixed-conifer types generally contain components of hemlock, cedar, spruce, and Douglas-fir. Many conifer types have a hardwood component, ranging from scattered trees and clumps to narrow riparian strips along streams. This structure is characterized by the closed crowns of the overstory trees, which prevent light from reaching most of the forest floor. This low light level precludes the introduction of both brush and shade-tolerant conifer species in the understory, thus leaving the forest floor sparsely vegetated. Of all the structure types, this type is the least used by wildlife species, especially species requiring more complex habitats.

### ***Understory***

Approximately 76 percent of the district is in UDS. This structure occurs where normal tree mortality, previous density management (precommercial thinning, partial cutting), poor

stocking, low growth sites, SNC, root disease, or a combination of these factors have prevented the overstory canopy from fully closing. As a result, an understory of herbs, shrubs, and small conifer trees has developed. On good sites in this structure type, large, healthy conifer trees with large crowns characterize the overstory. Some of these stands began in a low stocked condition, with the overstory canopies eventually closing enough to shade out some of the brush and allow young conifer regeneration to occur.

In the 1990's many acres were partial cut and have resulted in UDS stands over 50 years of age. Mixed conifer and hardwood stands also result in UDS structure. Conifer stands which have been thinned are expected to move back into the CSC structure unless further density management is done. A few conifer stands have had second entry partial cuts to keep the stand in UDS structure and begin developing the components of LYR stands. Some of these stands have begun to establish an understory of conifer or a second cohort in openings (heavier partial cuts). Other stands have taken longer or have not shown a response to partial cutting due to the impacts of SNC. While these stands are more open, the crowns remain small and needle retention is less than two years.

### ***Layered***

Approximately 5 percent of the district is currently in LYR structure. Most of these stands are mixed conifer or mixed conifer-hardwood stands resulting from natural regeneration. Some LYR stands resulted from early partial cuts done in the late 1970's. Other LYR stands on the district developed through natural disturbance like wind causing openings for second cohorts to become establish. These stands are usually mixed species stands with shade tolerant species of hemlock or cedar in the understory.

### ***Older Forest Structure***

Approximately 1 percent of the Tillamook District is classified as Older Forest Structure (OFS). These are natural stands of mixed conifer species of Douglas-fir, cedar, hemlock and spruce in varied combinations. The stands are widely scattered and found in small patches for the most part. Some of these stands exist because they were left during railroad logging and survived the Tillamook Burn. Most of these stands are along the north and west edges of the district. These stands contain large diameter trees, horizontal and vertical diversity as well as snags and down wood.

### ***Non-Silviculturally Capable – Non-Forest***

By definition, non-silviculturally capable (NSC) lands do not form a single structure type. However, these lands do provide unique and significant habitat contributions to the district landscape. Comprising 1 percent of the district, NSC lands are characterized by geologic and hydrologic conditions unsuitable for the commercial growth and harvest of forest tree species. Geologic conditions include rock cliffs, talus slopes, rock slopes and outcroppings, and other substrate conditions incapable of supporting forest tree species. These lands provide for plant and animal communities not associated with the other forest structures.

Non-silviculturally capable and non-forest areas are not considered part of the commercial forest land base and will not be managed for the growth and harvest of forest tree species.

These NSC sites are usually rock outcrops or rock slopes. These sites may have a few scattered trees but most only contain some small forb or brush species. It is recognized though, that these sites are unique habitats for plants and wildlife like peregrine falcons.

Non-Forest lands are silviculturally capable areas, greater than 5 acres. These are areas that are maintained in a permanently non-forest condition. Examples in this district include large power line right-of-ways.

## **Management Activities in Each Stand Type**

The annual harvest and silvicultural activities are summarized in Table 3-5. The following section discusses the purpose and rationale for these activities in each stand structure.

### ***Regeneration Stands***

Management activities in these stand types will consist of reforestation and pre-commercial thinning. The stand components reserved (green tree retention, snags, differing species, and large woody debris) during the clearcut harvest will be important for wildlife use and creating complex structure (vertical and horizontal diversity) in the developing stand. The young plantations will be managed for a diversity of tree species, rapid tree growth and stand health while retaining those large tree components from previous stands. These stands may also have dense areas of hardwoods along streams, draws and headwalls within the unit. Stands are expected to remain in the regeneration structure for 15 years.

### **Reforestation**

Reforestation is done within 2 years on all regeneration harvests and patch cuts over 5 acres. Spacing, species, and stock type depend on site-specific conditions and seedling availability. The district will reforest with native tree species. Vegetation management activities are undertaken in conjunction with stand establishment and maintenance, and could consist of chemical, manual, or mechanical site preparation or release. Most stands will be precommercially thinned but the timing (usually at 10 years) will depend on their growth and development. Hemlock, cedar, noble fir, spruce, and Douglas-fir are all being planted on the district to create species diversity. Natural regeneration of hardwood species occurs on most units at varying levels or will be planted in areas of root disease.

Precommercial thinning (PCT) is an important density management practice that thins out closely spaced trees, including small and defective young trees, in order to provide more water, light, and nutrients for the healthy residual trees. Diversity is enhanced by leaving a component of all tree species present in the stand. In addition, PCT keeps the canopy from closing, allowing residual trees to retain live crowns of 50-60%. This is crucial for Douglas-fir stands with moderate SNC infection because it keeps the trees vigorous enough to realize moderate growth. This also preserves the growth of herbaceous vegetation required by big game, while maintaining vigorous tree growth. All conifer plantations are available for PCT depending on their density.

## ***Closed Single Canopy Stands***

The CSC structure will occur across the landscape but is not necessarily a desired stand structure. As all stands continue to grow, they will either move into or return to this structure until another disturbance occurs, such as windthrow, disease, fire, or harvest activity.

### **Partial Cuts**

Past management experience has found that most CSC stands respond well to partial cutting. Not only do the residual trees grow faster, but also complex structures and diverse habitats develop more rapidly. Partial cuts can vary depending on the number of trees removed. Light partial cuts to a stand density index (SDI) of 40 percent and above are usually done in areas where there are T&E species concerns or moderate levels of SNC. Moderate partial cuts (SDI 25 to 35 percent) are normally done to promote the UDS stand structure while maximizing short-term volume production. Moderate partial cuts can also be applied to stands with a moderate level of SNC to keep the live crowns at 40-60% of the tree height. Heavy partial cuts (less than 25 percent SDI) are usually performed to develop another cohort via natural regeneration or underplanting. This prescription may be used to develop complex structure, LYR, and OFS. Heavy partial cuts may be used in stands that are in sensitive areas which cannot be regeneration harvested. This treatment may also be used to treat for health problems, such as SNC, by removing the majority of the infected trees and retaining hardwoods and conifers other than Douglas-fir. Partial cutting also produces timber, revenue, and enhancements to other resources, including scenic and wildlife resources. Therefore, the majority of current CSC stands will be partial cut, to help these stands develop into the UDS structure.

### **Regeneration Harvest**

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

- **Hardwood stands** –At this time, harvesting pure hardwood stands is a high priority due to their maturity and the value of the stands. It is desirable to harvest the hardwood stands before they deteriorate and replant with conifer to establish a productive mixed species stand. Hardwoods will be retained on the landscape in riparian areas and headwalls or will be reserved in clumps and patches. Hardwoods develop easily through natural regeneration in disturbed soil if there is a seed source near. Plantations established after the harvest of a hardwood stand are anticipated to contain 10-15% hardwoods when they are free-to-grow. It is expected that hardwoods will comprise at least 10% of the forest at any given time.
- **Swiss Needle Cast infected stands** – Douglas-fir stands with severe SNC and some stands with moderate SNC will be regeneration harvested to establish a healthy plantation of vigorously growing mixed conifer which can be either grown for complex structure or for timber production. Stands severely infected with SNC have needle retention of less than 2 years, reduced height growth, and reduced diameter growth. These stands provide reduced cover for wildlife and do not contain the structure

components to grow into a LYR or OFS stand. For some stands containing other conifer species, a retention harvest can move the stand to UDS after the harvest and on to a complex structure by removing the SNC Douglas-fir and replanting the openings with shade tolerant species. SNC stands will be evaluated for stand growth and vigor using management guidance outlined in the *Strategic Plan for Managing State Forests in NW Oregon Affected by SNC*.

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

## ***Understory Stands***

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

### **Partial Cut**

Future partial cutting is planned to promote the development or maintenance of complex stand structure. Most second entry partial cuts will be moderate, with some 2 to 5 acre patch cuts to stimulate further development of the second cohorts started with previous partial cuts. The second entry partial cutting will remove the smaller trees with small crowns and retain the largest trees with large crowns and in good health. In order to promote development of LYR and OFS stand structures; the prescription in UDS stands often includes reserving some of the smaller shade-tolerant trees in the understory such as hemlock, spruce, and cedar. Snags and down wood will be retained or created in these operations.

### **Regeneration Harvest**

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

- **Swiss needle cast infected stands** — Many severe SNC and some moderate SNC stands are classified as UDS because of the amount of understory growth, which is the result of low needle retention on the trees allowing light to pass through the crowns onto the forest floor. An option for UDS stands with a significant SNC is a regeneration harvest. The reduced needle retention in the crowns makes these stands bad candidates for creating complex structure. Retention harvests in UDS stands with SNC and other conifer can create a variable density stand which can be grown into a LYR or OFS stand. Larger Douglas-fir trees become good candidates for snag and down wood creation.

- **Hardwood stands** – Many hardwood stands are classified as UDS because other tree and shrub species have persisted in the understory. A regeneration harvest of the mature hardwood will remove the valuable overstory and releasing the understory trees. Replanting the harvest area with mixed conifer will create a two-cohort stand for future complex structure. Hardwood stands typically begin to deteriorate after 60 to 90 years. As the hardwoods die, brush or other understory species will persist on the landscape. By removing the hardwoods and replanting with conifer, the likelihood of brush dominating the site is reduced and the value of the hardwood is recovered. Hardwoods are not replanted on these sites because natural regeneration is expected.
- **Low-stocked stands** — In UDS stands that are poorly stocked, and have a brush understory, the preferred management option is to regeneration harvest. In these poorly stocked stands, the emphasis will be to reforest the site with a well-stocked plantation using a mix of native conifer species. These sites will be converted to vigorous young stands of REG structure while providing foraging habitat for big game. In addition, live green trees will be retained and snags and down wood will be retained or created to complement the new stand.

### ***Layered Stands***

The overall management goal will be to maintain or enhance opportunities for future management or structure development. In these stand structures, harvest prescriptions and operational concerns are reviewed with ODFW biologists as well as ODF wildlife biologists, during reviews of annual operations plans (AOP). All the LYR structure currently on the district will be retained for at least the next 10 years.

#### **Partial Cut**

These stands will be monitored over time, and partial cutting may be prescribed. Light or moderate partial cutting and/or group selection cutting may be prescribed to create small openings and continue understory tree growth and development as well as maintaining growing space for larger trees. Partial cutting could include removing Douglas-fir severely infected with SNC and leaving the other conifer and hardwoods.

### ***Older Forest Structure Stands***

These stands are often found in scattered areas and may be managed in conjunction with surrounding stands. However, many of these stands are associated with T&E species and are not available for timber management. None of these stands will be clearcut in this planning period.

#### **Partial Cut**

It is conceivable that a dense stand of OFS could be partial cut to promote increased overstory tree diameter growth and understory tree response. This would also be an opportunity to create additional hard snags and large down wood within the stand.

# Proposed Management Activities

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

## *Silvicultural Activities*

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

Activity	Estimated Annual Acres
Partial cut	850 – 3,450 acres <sup>1</sup>
Regeneration Harvest	800 – 3,150 acres <sup>2,3</sup>
Reforestation <sup>4</sup>	800 – 4500 acres
Precommercial Thinning	0 – 6,000 acres
Fertilization <sup>5</sup>	0

1. Patch cuts less than five acres will count toward the annual partial cut objective.
2. For this 10-year planning period, stands with a current condition of OFS will not be considered for regeneration harvest.
3. Patch cuts greater than five acres will count toward the annual regeneration harvest total.
4. Regeneration harvests will be replanted within two years of harvest. Replanting portions of regeneration harvests is expected due to areas of unsuccessful reforestation.
5. This activity is at zero due to the impacts of SNC and unknown impacts of intensive management on stressed Douglas-fir stands.

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

## **Roads**

- Guidance for achieving the desired condition will come from the *Forest Roads Manual* (ODF, July 2000) and the developing *Tillamook District Transportation Plan*.

## **Potential Road Activities**

The district has been working on a pilot transportation planning project in the Central Wilson Basin as part of the creation of a State Forest Transportation Plan template. Transportation planning will assist the district identify the amount and types of roads needed to access forest land and the cost of these roads. Currently there are several-basins with little access and no plan of how many miles of road are needed or the cost to access the basin.

Developing a planned road system will make this information available to assist with future IPs and Annual Operations Plans.

The district has started an in-depth review, by basin, of access needs for the development of the district transportation plan. Table 7 below indicates that most of the planned District road work over the last 6 years has been improvement of existing substandard roads to current standards. The transportation planning that will occur during this planning period should identify the most efficient and environmentally sound locations for significant new roads that will be needed.

Tillamook is taking a proactive approach to repairing/closing roads consistent with ODF funding levels. Additional details can be found in the **Management Basins** section of this document. The District will reduce the extent of permanent roads whenever possible considering recreation, fire protection and management

A majority of the roads to be constructed will be single spur roads within timber sale areas. These spurs will be narrow and have lengths between 0.1 and 1.5 miles. Collectors that connect these sale areas to the mainline system make up the remaining 30 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.

Tillamook District is aware of the increase of 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.

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

<b>Activity</b>	<b>Estimated Annual Mileage</b>
New Construction	15.5 miles
Road Improvement	43 miles
Road Vacating	1.2 miles

### ***Slope Stability***

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

Landslide hazards may be exacerbated by management activities. Timber harvest may reduce root strength affecting overall soil strength and increasing susceptibility to shallow landslides. Timber harvest may also reduce canopy interception of rainfall affecting slope

hydrology and increasing susceptibility to shallow landslides and potentially deep-seated landslides as well. Standing timber, as well as large downed wood, tends to reduce debris flow travel distances. Roads may affect slope stability by altering slope geometry with cuts and fills and by altering slope hydrology.

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

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

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

## ***Recreation***

During 2009-2010, the District will be working with the State Forests Division to address recommendations that stem from the Second Party Recreation Assessment and the subsequent Recreation Action Plan, which will include carefully examining the role that State Forest recreation plays in a regional context of outdoor recreation opportunities and providers; conducting a recreation program workload analysis that can help ensure that individual units have properly identified the resources they need to get the job done; addressing specific gaps in standards, policies and procedures; and embarking, with participation from the Board of Forestry, on a process to articulate a clear vision for the role of recreation on State Forest lands. In the near-term however, financial resources are limited, necessitating that recreation related resources and workloads be focused primarily on maintaining the existing infrastructure. New projects or those being eyed for the foreseeable future will depend heavily on successfully securing grant funding.

## Existing Facilities and Programs

- **Public Safety and Law Enforcement** – Increasing communication with recreational users is a top priority to address public safety concerns. A few of the actions to improve communication are distributing notices, and newsletters addressing locations of active forest operations and other events as well as posting information at trailheads and campgrounds and on the ODF website. Work is planned to identify cell phone access sites, improve communications with camp hosts, trail patrol, and law enforcement. Efforts improving road signs, maps, and brochures are on-going.

Three full-time Tillamook County Sheriff's deputies enforce public use laws on the state forest, through an intergovernmental agreement. Expanded law enforcement coordination is occurring with officers from Washington and Clatsop County Sheriff's Office. A review of timing and location of officer patrols is a priority to focus patrol in the forest during short periods of high use such as holiday weekends and spring break.

- **Tillamook Forest Center** — The Tillamook Forest Center is in operation at its location on Cedar Creek Flat, near mile post 22 on the Wilson River Highway. Typical activities on-site during this time will include: routine maintenance of the building and grounds; guided and self-guided public use of the trails including many school groups; access to the river by interpretive trails; continued but minor management activities in the demonstration forest. The Center is expected to host more than 50,000 people per year, generating a large amount of automobile traffic at the site. The Smith Homestead Day Use Area, located ½ mile east of the Center, will also host many school groups, family activities, and other visitors.
- **Management and maintenance** — The basic recreation program management and maintenance workload will continue to increase as visitation increases. The trail system demands a high level of maintenance to minimize trail damage and water quality problems. Approximately 50 to 65 percent of the total trail system will require maintenance each year. In addition, a percentage of the OHV trails need the surfacing upgraded in order to handle the level of use and prevent damage. Other types of maintenance workloads and costs include garbage and recycling service, vault toilet cleaning and pumping, well maintenance, sign replacement and maintenance, trail bridge repair, vegetation control, resource enhancement, and vandalism repairs.
- **Volunteer Program** – A multi-faceted volunteer program has been established within the district. The volunteer program takes a substantial amount of dedicated staff time for effective planning and use of volunteers. The volunteer program includes the following sub-programs.
  - Camp hosts
  - OHV trail patrol
  - Trail machine volunteers

- SOLV (Stop Oregon Litter and Vandalism) forest clean-up
- Trail maintenance and construction work days
- Motorized and non-motorized trail planning groups
- North Coast Travel Management Area volunteers
- Cooperative agreements with OHV clubs for project work and maintenance

The average hours-per-year is over 3,000 hours of volunteer time on the district. Volunteer hours are expected to increase in the future. The trash and dumpsite cleanup is coordinated and overseen by the recreation department and implemented mostly through volunteers and South Fork Camp inmates.

- **Event management** — The Tillamook District permits organized club-sponsored trail use events. Both motorized and non-motorized trail events are held on the district. On the average, 10 to 15 OHV (off-highway vehicle) events are permitted on the district each year. The events consist of poker runs (fun runs), competitive timed motorcycle races, trials motorcycle competitions, four-wheel drive rallies, and competitive four-wheel drive events. The OHV events occur within the Wilson Basin and the Trask Basin. Other events, such as equestrian poker rides, mountain bike races, and education-related events are scheduled less frequently and primarily occur within the Wilson basin.

### ***Aquatic Resources: Stream Enhancement Projects***

On the Tillamook District, many fish passage and stream restoration projects have been accomplished over the last eighteen years. These projects have focused on the South and East Forks of the Trask River, Edwards Creek, Anderson Creek, Kilchis River, and Miami River, as well as several smaller streams. These projects have either been associated with timber sales or funded by grants combined with budgeted matching funds.

Future projects will be high priority instream and riparian restoration work and projects identified in the watershed assessments. Beyond 2009, the Department of Forestry anticipates that at least one large instream project will be completed each year for the next several years. Basins that will receive future work include the Trask, the Kilchis, and the Lower Nehalem. Additional, smaller projects may be done in the Tillamook and Nestucca basins.

Preservation and enhancement of complex, properly functioning aquatic habitats will continue to be a high priority. Active restoration projects will be implemented where appropriate to accelerate natural processes. Upland management activities will be designed to protect aquatic resources.

The district will also implement the action items identified in the *Tillamook Bay National Estuary's Comprehensive Conservation and Management Plan for Tillamook Bay, Oregon* (1999). These actions include reducing erosion and sedimentation as well as fisheries projects.

Stream enhancement projects will be accomplished in accordance with the *Oregon Plan for Salmon and Watersheds* and in consultation with the Oregon Department of Fish and Wildlife (ODFW). Candidates for instream habitat enhancement will be identified by

ODFW and watershed assessments performed on the district. To date watershed assessments have been completed for the Trask, Miami, Tillamook Bay, and the Wilson River watersheds.

### ***Cultural Resources***

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

### ***Energy and Mineral Resources***

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

### ***Lands and Access***

The district will carry out the following activities.

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

- Prioritized and scheduled the establishment and maintenance of property corners and lines will be through the Annual Operations Plans.

Currently the district is developing a long term land exchange plan but has no current land exchange in progress. Desired land exchanges would be to acquire small parcels within or adjacent to district property that would enhance access or resource protection.

## **Scenic Resources**

The district will carry out the following activities:

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

## **Management Opportunities**

Scenic resources are site-specific viewsheds that can be seen from highways, major access roadways, trails, waterways, community viewsheds, and viewpoints. Viewshed management opportunities will exist when timber sale harvests are planned for areas near scenic resources. Timber sale harvests may also be planned that enhance scenic resources.

## **Plants**

### **Threatened & Endangered 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 3-7) 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.

**Table 8. Tillamook District Endangered, Threatened or Candidate Plant Species**

<b>Genus</b>	<b>Species</b>	<b>Subspecies</b>	<b>Common name<sup>1</sup></b>	<b>Status</b>	<b>Record exists<sup>2</sup></b>	<b>Potential to be present</b>
<b>Threatened and Endangered Plants</b>						
<i>Cordylanthus</i>	<i>maritimus</i>	<i>palustris</i>	<b>Salt-marsh bird's beak</b>	SE		✓
<i>Erythronium</i>	<i>elegans</i>		<b>Coast Range fawn-lily</b>	ST	✓	
<b>Plants of Special Concern</b>						
<i>Castilleja</i>	<i>chambersii</i>		<b>Chamber's paintbrush</b>	SP		✓
<i>Dodecatheon</i>	<i>austrofrigidum</i>		<b>Frigid shootingstar</b>	SP	✓	
<b>Candidate Plants</b>						
<i>Cardamine</i>	<i>pattersonii</i>		<b>Saddle Mt. bittercress</b>	SC		✓
<i>Filipendula</i>	<i>occidentalis</i>		<b>Queen-of-the-forest</b>	SC	✓	
<i>Saxifraga</i>	<i>hitchcockiana</i>		<b>Saddle Mt. saxifrage</b>	SC	✓	
<i>Sidalcea</i>	<i>hirtipes</i>		<b>Bristly-stemmed sidalcea</b>	SC	✓	

<sup>1</sup>Plant names in bold are on the NW FMP list of plants.

<sup>2</sup>Plants have been observed on or in close proximity to state forestlands.

**Status:**

- SE – State Endangered
- ST – State Threatened
- SC – State Candidate
- SP – Special Concern

**Non-native / Invasive Plants**

The NWFMP Forest Health Strategies call for monitoring pest populations, damage levels and trends, to use Integrated Pest Management (IPM) to suppress or prevent damaging pest populations, and to cooperate with other agencies and associations to prevent the introduction of non-native pests. (pg. 4-77 to 4-79). The Draft District Invasive Weed Management Plan (2009) address how individual Districts will contribute to statewide efforts to reduce the quantity and range of invasive, non-native plant species.

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

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

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

### ***Special Forest Products***

The district will carry out the following activities:

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

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# Landscape Design Overview

The landscape design process was a collaborative effort between ODF and ODFW fish and wildlife biologists, resource specialists, silviculturalists, and district planners and foresters. The district intends to achieve the desired future condition of 40% complex stands on the district by designating areas for older forest structure (OFS) and layered (LYR) stand structures across the landscape, ensuring a variety of forest patch sizes and shapes that provide connectivity between watersheds, and dispersal habitat for wildlife. The 40% design will not be evenly distributed between the basins but instead will be designated using the criteria outlined below. The overall management of the district will also include habitats necessary for those species needing more open conditions. The desired future condition map can be found in the attached **Map Section**.

The Tillamook district's landscape design was developed using two main strategies. The first strategy was to identify the stands on the district that met the following criteria:

- All stands currently complex (LYR and OFS)
- Stands that will grow into complex structure within the next 20 years
- Stands that are potentially functional habitat within and adjacent to known Northern Spotted Owl habitat and Marbled Murrelet Management Areas (MMMA's)

All of these stands are primarily multiple species stands usually with a shade tolerant species, and stands with low levels of SNC on higher site ground. Some of these stands have already had one or two partial cut entries and understory development has begun. Approximately 16 percent of the Tillamook district is considered capable of growing into complex structure within the next 20 years.

For the second strategy the district identified the remaining 34 percent of the land base focusing on areas that could build upon the first 16 percent by enhancing patch size, distribution, connectivity, and habitat functionality giving higher priority to those areas that are being managed for multiple resource goals.

This design focused on stands that are capable of contributing to biological goals in areas where existing encumbrances, land use designations, and/or terrain, limit timber harvest options. Some of these areas have steep slopes, low site, and poor access. In many cases, conventional road building and timber harvest operations may not be feasible; thus the development of complex forest structures may take longer to achieve (80-100 years or more from present). See Table below for approximate complex forest development timelines.

The criteria used to designate the remaining 34% are listed below:

- All stands within the NSO cluster and NSO priority circles that were not included in the first 16%
- Important aquatic & riparian (including SAH and other selected important streams & headwaters)
- Stands that serve multiple or secondary objectives (public safety and landslide prone, recreation, visual, operationally limited, etc.)
- Mixed species stands
- Stands that are providing connectivity between riparian stands and upland DFC complex stands
- Areas with high levels of DWD/snags
- Stands that provide connectivity between selected upland complex and selected riparian
- Non-harvestable stands in SAH, mixed species stands, and certain stream and headwater adjacent stands

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

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

Due to the varying factors across the District (current stand condition, age, species, seed source, T&E distribution, recreation, etc) development of complex forest structures will occur at different times in the future. The district took into consideration the factors listed above and used professional judgment to predict how fast the landscape design targets could be met. The results are outlined in the table below.

Pace in Years	% of Landscape Design
0 to 20	16%
21-40	7%
41-60	6%

61-80	8%
80+	3%
Total	40%

It will take over 30 years to meet the Board of Forestry performance measure to reach 20% complex stand structure on the Tillamook District.

### **Implementation of Landscape Design**

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

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

The district may identify a site designated for the development of complex structure on the landscape design map that is not currently suitable and/or desirable for the development of complex structure. In these cases the landscape design may be changed, replacing the less desirable site with a site of comparable acreage that is better suited for the development of complex structure.

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

# Management Basins

## Management Basins Overview

Management basins have been designated by using the fifth order watersheds as defined by the OWRD. This approach identified nine major basins: North Fork of the Nehalem, Lower Nehalem, Miami, Kilchis, Wilson, Tillamook, Trask, Nestucca, and Little Nestucca. Two other basins were also identified: the Tillamook Bay basin, which flows into Tillamook Bay; and the Short Sands Basin, which flows into the ocean. The following table summarizes basic information about the basins, listed from north to south.

## Information Summary for All Management Basins

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

Management Basin	Acres	NSC/ Non-Forest***				NON	COMPLEX CONDITION			
			REG	CSC	UDS	COMPLEX	LYR		OFS	
			CC	CC	CC	CC	DFC	CC	DFC	CC
North Fork Nehalem	7,303	0	17	22	33	57	13	4	15	39
Lower Nehalem	59,634	1	6	6	76	57	10	15	1	28
Short Sands	109	0	0	0	77	0	23	0	0	100
Miami	13,784	0	9	13	69	70	6	19	3	51
Kilchis	33,695	0	2	9	83	31	4	43	2	26
Tillamook Bay	1,900	1	15	33	36	52	2	2	13	46
Wilson	65,998	1	10	8	78	65	3	23	0	12
Tillamook River	3,460	1	7	30	53	60	8	2	1	39
Trask	56,380	0	11	8	80	81	1	15	0	4
Nestucca	7,547	1	10	24	63	75	1	13	1	12
Little Nestucca	791	1	2	48	37	38	10	22	2	42
District Total	250,601	1	8%	9%	76%	60%	5%	20	1%	20

\*\*\* 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).

The *Northwest Oregon State Forests Management Plan* (page 4-48) ranges for the desired future condition of stand structure types are:

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

The Tillamook District's DFC is based on the landscape design (Table 9 above). The response of stands to management will determine how quickly these estimates can be achieved. Management will be made on a stand by stand basis keeping the landscape perspectives in mind.

The state forest lands in Short Sands, Nestucca, and Little Nestucca basins are scattered parcels that are desirable to exchange. However, these parcels will be managed for biological concerns first. The upper Kilchis Basin has difficult access for partial cutting and little complex forest structure, making it unfeasible to manage that land to achieve biodiversity in an acceptable time frame.

It will take 80 to 100 years to achieve the 40% complex structure for the district. This estimate assumes that 2 or more partial cut entries will be required, plus 10 to 20 years after the last partial cut, to achieve OFS. The estimate also assumes that total stand ages of 90 to 110 years will be required to produce OFS and that SNC will limit development of some stands.

## **Basin Descriptions**

### ***North Fork Nehalem Basin***

The basin has a total of 17,961 acres, with state forest land consisting of 7,303 acres (41 percent of the basin) in two parcels. The two parcels of state land are adjacent to private industrial forest ownership and are separated by the North Fork of the Nehalem River and agricultural land in the river floodplain.

#### **State Forest Land in the Basin**

County Line Road and God's Valley County Road access the God's Valley and Acey Creek sub-basins. The Coal Creek sub-basin is accessed by Coal Creek Road. There are several Marbled Murrelet Management Areas (MMAs) within this basin. A portion of this basin is also located in the Coal Creek Salmon Anchor Habitat (SAH) basin. There is one large Type F stream, Coal Creek, within the state-owned portion of the sub-basin. This stream and others make up the 17 miles of Type F streams in the basin. Throughout the North Fork Nehalem basin the stands are predominately hemlock, spruce and Douglas-fir. The majority of the stands are naturally regenerated stands more than 50 years old or plantations less than 40 years old. Past management consisted of planting, release, precommercial thinning,

pruning, partial cutting, and clearcutting. The basin is currently fragmented by past management, with some larger blocks of mature mixed conifer.

Recreation activity in the basin has been mainly hunting, dispersed camping, mountain biking, and scenic driving. ODF, in cooperation with the ODFW and the Oregon Hunters Association, signs about 30 percent of the roads in the God's Valley Area as closed to vehicle traffic during the general deer and elk rifle season. The North Coast Travel Management Program is intended to improve the hunting experience, decrease road damage, and improve big game escapement. There is a non-motorized trail (hiking, mountain biking, horse back riding) located along Coal Creek.

### **Key Resource Considerations**

- Marbled Murrelet Management Areas (MMMA) are designated on 1,769 acres
- A small portion of the east side of this basin is located in two NSO circles: Lost Creek and Bastard Creek.
- A bald eagle nesting site was identified in the western portion of the ownership in 1996.
- Core coho salmon areas are located within this basin. The Coal Creek SAH has been designated on 1,348 acres of Tillamook District along Coal Creek.
- There are 17 miles of fish bearing (Type F) streams located in this basin.
- Several domestic water sources are located on or within 100 feet of state forest land.
- Portions of state-owned land within the basin are visible from the city of Nehalem and approximately 1.5 miles of state forest land borders Highway 53; this land has a visual sensitivity rating of 2. Some ridge tops on the western edge of state forest land are visible from Highway 101 as well.
- 1.9 miles of non-motorized trail (hiking, mountain biking, horse back riding) located along Coal Creek.
- The transportation system provides good access; a few spurs need construction and collectors/spurs will be assessed for road improvement; and the rest of the road system will be maintained as needed.

### **Landscape Design & Desired Future Condition**

Approximately 43% of this basin will be managed for complex stand structures; the majority of this is designated as OFS. The OFS stands are located in known T&E sites and along important salmonid streams within the Coal Creek Sub-basin SAH. The North Fork Nehalem Basin will provide a range of habitat types, with complex habitats generally less than 500 acres. The basin will be fragmented, with complex habitats located in the mixed conifer stands more than 50 years old that are suitable for long-term retention, and in vigorous mixed conifer stands.

## **Management Opportunities**

Harvest - The portions of the North Fork Nehalem that are designated as LYR or OFS will be managed towards complex condition and will have no clearcuts and very limited amounts of partial cutting done within them. Both clearcut and partial cut opportunities exist in the remaining portions of the basin that are not planned for a complex future condition. Mixed conifer stands will be targeted for density management harvests. Regeneration structure over the next 10 years will come mainly from stands less than 50 years old that are showing signs of poor growth and/or SNC. Other candidates for regeneration structures will come from hardwood stands. The SAH designation in Coal Creek is not expected to impact management in the sub-basin since most of the basin has already been treated.

Transportation - This basin is a low priority for transportation planning and/or investments in the infra-structure. Road construction and improvement will be completed at a lower rate than was done in the last ten years.

## ***Lower Nehalem Basin***

The basin has a total of 88,593 acres; state forest land consists of 59,634 acres (67 percent) of the total. The western portion of the basin is privately owned.

### **State Forest Land in the Basin**

Access to the basin is by way of Foss, Miami-Foley, and God's Valley county roads. This basin contains several sub-basins: Anderson Creek, Foley Creek, Lost Creek, Cook Creek, Cronin Creek, South Fork Salmonberry and Lower Salmonberry. The Salmonberry is an important wild fish stream. Salmon Anchor Habitat Areas have been designated in the Foley Creek, Cook Creek and the South Fork Salmonberry River Sub-Basins. Several MMMAs and one NSO Activity Center have been designated in this basin.

Most stands in the basin, with the exception of Lost Creek and Cook Creek, are predominately naturally regenerated mixed conifer and hardwood stands that are 50 years and older. The Lost Creek and Cook Creek sub-basins are predominately 35 to 55-year-old planted or seeded Douglas-fir stands that have a large component of alder. There are also many hardwood stands within these basins that only have a small component of conifer.

Recreation attractions include Nehalem Falls Campground, river access to the Nehalem River, dispersed camping along Cook Creek and the Nehalem River, and high scenic viewpoints such as Foley Peak, Pinochle Peak, and Lost Creek Ridge. The main recreation activities are dispersed camping, hunting, fishing, limited hiking, and day-use activities such as swimming, and kayaking in the spring and fall. A moderate level of OHV use occurs in the Cook Creek sub-basin and is generally associated with dispersed camping and hunting activity. Currently management focus limits OHV use to maintained forest roads and a limited network of old roads, firebreaks, and trails. The Salmonberry River is an important fishing area and is reached by hiking the Port of Tillamook Bay railway tracks.

### **Key Resource Considerations**

- Marbled Murrelet Management Areas (MMMAs) are designated on 1,008 acres.

- An NSO Activity Center has been designated as the Bastard Creek Pair Site. A portion of the Foley Creek sub-basin is in the Miami and Lower Miami Owl circles
- Core coho salmon areas are located within this basin, and the Salmonberry is managed as an important wild fish stream. SAHs are designated on Foley Creek, Cook Creek and South Fork Salmonberry River encompassing 26,818 acres of Tillamook District.
- There are 95 miles of fish bearing (Type F) streams located on ODF ownership in this basin
- Several domestic water sources are located on or within 100 feet of state forest land.
- A small portion of state-owned land within the Foley Creek and Anderson Creek sub-basin are visible from the city of Nehalem and Highway 53; this land has a visual sensitivity rating of 2.
- Numerous dispersed campsites are located in and adjacent to many of the riparian areas in this basin.
- There are several cultural resources in this basin.
- There is a known T&E plant in this basin.
- There are 1.5 miles of motorized trails and .5 miles of non-motorized trails in this basin. There many additional unauthorized OHV trails and construction found in this basin primarily associated with hunting activity.
- The transportation system provides limited access; access to some areas is good but some large areas need access developed. Easements may be needed, with some road construction, relocation, and improvement. The rest of the road system will be maintained as needed.

### **Landscape Design & Desired Future Condition**

Approximately 43% of this basin will be managed for OFS and LYR stand structures. The complex habitats designated in this basin are predominately located in the mixed conifer stands more than 50 years old that are suitable for long-term retention. A large portion of the South Fork Salmonberry River SAH, the Cook Creek SAH, and the Foley Creek SAH are designated with a mixture of OFS and LYR stands to enhance core salmon area protection. The remaining LYR and OFS stands have been located in stands with high levels of down wood and snags, within stream adjacent stands, within stands that provide connectivity to upland habitats, and in stands that are known T&E sites. Overall the Lower Nehalem Basin will provide a range of habitat types, with complex habitats ranging from larger than 2,000 acres to less than 100 acres.

### **Management Opportunities**

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

The portions of the Lower Nehalem that are designated as LYR of OFS will be managed towards complex condition using density management where possible. A minor amount of regeneration harvest will be done to help move some stands towards a complex condition within the basin. Both clearcut and partial cut opportunities exist in the remaining portions of the basin that are not planned for a complex future condition. Mixed conifer stands will be targeted for density management harvests. Regeneration structure over the next 10 years will come from harvesting hardwood-dominated stands, dense unmanaged conifer stands, and conifer stands that are showing signs of poor growth and/or symptoms of SNC. The SAH designation in the South Fork of the Salmonberry is not expected to impact management during the planning period since most opportunities are partial cuts. The SAH in the Cook Creek sub-basin is not expected to impact management since many stands are hardwood, which is not a priority for clearcut harvest during this planning period, and the Foley Creek SAH is designated in areas of difficult access.

Transportation - This basin is a high priority for transportation planning and/or investments in the infra-structure. Road construction and improvement will be completed at a similar to higher rate than was done in the last ten years.

### ***Short Sands Basin***

The basin has a total of 3,203 acres; state forest land consists of 109 acres (3.4 percent). The Short Sands Basin drains into the Pacific Ocean. The western portion of the basin is owned by the OPRD, and the majority of the private land is industrial forest land.

#### **State Forest Land in the Basin**

Short Sands Basin contains one parcel that is adjacent to Oswald West State Park. The trees range from 65 to more than 100 years old; there is a conifer stand with some hardwoods. This parcel is special stewardship, park buffer and may eventually be exchanged to the OPRD.

No recreation management is directed toward this basin at this time. Use of the basin consists primarily of hikers and mountain bikers in the western parcel and hunters in the eastern parcel.

#### **Key Resource Considerations**

- State land in T3N, R10W, Section 7, adjacent to Oswald West State Park, is designated as Special Stewardship.

#### **Landscape Design & Desired Future Condition**

All of the Short Sands basin will be managed towards OFS. This stand will provide connectivity to the neighboring Oswald West State Park.

#### **Management Opportunities**

Harvest – There are no management opportunities in this basin during this planning period.

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

## ***Miami Basin***

The basin has a total of 23,053 acres; state forest land consists of 13,784 acres (60 percent). The lower basin is adjacent to private industrial forest land and agricultural land in the Miami River floodplain.

### **State Forest Land in the Basin**

Access to the basin is by Highway 101 and the Miami Foley County Road. All of the Miami Basin is a designated SAH. Portions of the state land in the lower basin are visible from Garibaldi and Highway 101. Marbled murrelets occupy several sites in the lower basin and two NSO Activity Centers are located in the upper basin. Approximately 7 percent of the basin is Common School Forest Land.

The basin's forest is predominately 45 to 65-year-old mixed conifer/hardwood stands. Hardwood stands comprise 35 percent of the basin. Some of these are in riparian management areas; there are also large contiguous acres of hardwoods in the upper basin. Patches of older trees are located primarily along riparian areas. The majority of the Douglas-fir was either seeded or planted in this basin and is mostly in plantations less than 50 years old.

Recreation use in the Miami Basin is primarily hunting, dispersed camping, fishing, moderate OHV use, and limited mountain biking on the road system. Several camping sites are located along the Miami River. OHV use is generally confined to active and abandoned roads.

Recreation management has focused on mitigating the impacts from summer and hunting season dispersed camping, and discouraging unauthorized OHV trail construction. Regular patrol has reduced the incidence of long-term camping and the impacts from litter and human waste. The Department of Forestry has physically blocked some of the OHV trails.

### **Key Resource Considerations**

- The portion of the upper basin adjacent to the Kilchis Basin has limited road access opportunities due to terrain.
- Two NSO Activity Centers have been designated in the basin. One center is a pair and the other is resident single.
- Marbled murrelet habitat is designated on 280 acres.
- Core coho salmon areas are located within this basin. A SAH encompasses all state forest land in the basin.
- There are 20 miles of fish bearing (Type F) streams located on ODF ownership in this basin
- Several domestic water sources are located on or within 100 feet of state forest land.
- Wells for the City of Garibaldi municipal water system are located in the basin.
- Approximately 1,675 acres are visible from Highway 101 and the city of Garibaldi, and have a visual sensitivity level of 1. A visual sensitivity rating of 2 is given to state forest lands near the Miami Foley County Road.

- Unauthorized OHV trail use has pushed into areas zoned for non-motorized use within this basin.
- There are several dispersed campsites along Miami River.
- The transportation system provides limited access; access to some areas is good but some large areas need access developed. The rest of the road system will be maintained as needed.

### **Landscape Design & Desired Future Condition**

For fish, northern spotted owl, and marbled murrelet resources, approximately 70 percent of the basin will be managed for complex stand structures, with the majority designated as OFS. OFS and LYR stands will be located in known T&E sites, along the salmonid streams within the Miami River SAH, and within mixed conifer/hardwood stands that have known high levels of snags and down wood.

### **Management Opportunities**

Harvest – Regeneration opportunities for this basin are low due to the high percentage of Desired Future Condition – Complex and T&E restrictions in this basin. A minor amount of regeneration harvest will be done to help move some stands towards a complex condition within the basin. Both clearcut and partial cut opportunities exist in the remaining portions of the basin that are not planned for a complex future condition. Mixed conifer stands will be targeted for density management harvests. Regeneration structure over the next 10 years will come from harvesting hardwood-dominated stands, dense unmanaged conifer stands, and conifer stands that are showing signs of poor growth and/or symptoms of SNC.

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

## ***Kilchis Basin***

The basin has a total of 41,581 acres, with state forest land consisting of 33,695 acres (81 percent). Kilchis County Park is located in the basin and surrounded by state forest lands.

### **State Forest Land in the Basin**

Most access is by Kilchis Forest Road. The Sub-basins include the Upper Kilchis, Middle Kilchis, and Lower Kilchis. In the basin there is approximately 57 miles of fish-bearing streams and there is a designated SAH in the Middle Kilchis River sub-basin. Common School Forest Land in the lower basin is influenced by an owl cluster and designated marbled murrelet habitat. Stands adjacent to the Kilchis River have deed restrictions that limit or exclude harvest activity to develop structure. Much of the Clear Creek drainage which is a part of the Lower Kilchis sub-basin is managed by the BLM and is designated as Late Successional Management Areas (LSMA).

The forests in the Upper Kilchis sub-basin are generally in a distinctly different age class and stand type than the Middle and Lower Kilchis Basins. Over 60 percent of the basin's

stands are in the 35- to 55-year age class. Most of these stands are predominately Douglas-fir and hardwood with scattered other conifer. Both the Middle and Lower Kilchis have mixed conifer and hardwood stands that range in age from 60 to over 100 years old.

The Kilchis Basin receives heavy recreation use and is a popular destination for local communities. The basin is rugged and features the Kilchis Falls and the remote Sawtooth Ridge area. The South Fork of the Kilchis is the most remote area of the Tillamook State Forest. Recreation activities include hunting, fishing, drift boat and kayak use, swimming, dispersed camping, hiking, OHV use, mountain biking, and scenic driving. Recreation management has focused on management of dispersed camping impacts. The area is designated for non-motorized trail development.

### **Key Resource Considerations**

- The Upper and Middle Kilchis sub-basins have limited road access.
- Marbled murrelet habitat is designated on 620 acres in the basin
- A NSO cluster (Kilchis Cluster) is centered in the basin with a historic spotted owl site.
- Core coho salmon areas are located within this basin. The Middle Kilchis River SAH encompasses 14,154 acres of state forest.
- There are 53 miles of fish bearing (Type F) streams located on ODF ownership in this basin
- Several domestic water sources are located on or within 100 feet of state forest land.
- Bay City municipal water wells (groundwater wells) are located in the basin.
- Approximately 964 acres are designated as Visual. Portions of these acres are visible from Highway 101 and the city of Bay City and the city of Tillamook, and have a visual sensitivity level of 1.
- Deed restrictions on lands adjacent to the Kilchis River include county and state lands designated for park and recreation use.
- There is approximately 3 miles of designated motorized trails and .4 miles of non-motorized trails within this basin. Unauthorized OHV trail construction is being done in remote areas of the basin.
- The transportation system provides inadequate access; a large part of the basin has no access developed. The rest of the road system will be maintained as needed.

### **Landscape Design & Desired Future Condition**

Approximately 69% percent of this basin will be managed for complex stands. With numerous coho streams, the Middle Kilchis SAH, and the spotted owl cluster, the focus will be on developing OFS and LYR stand structures quickly where possible. Due to the rugged terrain and low site in the Upper Kilchis sub-basin, these complex structures will take longer to develop than in other parts of the district. For the most part, these complex forest structures will develop naturally with little or no silvicultural manipulations. The entire

cluster that is located in this basin is on a pathway to OFS or LYR. Additional areas that have been designated as complex within this basin include areas adjacent to the Kilchis River that are designated only for recreation use, areas adjacent to the county park and BLM ownership that provide connectivity to other habitats within the basin

### **Management Opportunities**

Harvest – There are few harvest opportunities for this basin due to steep rocky terrain, poor access and the high percentage of Desired Future Condition – Complex, steep terrain. A minor amount of regeneration harvest will be done to help move some stands towards a complex condition within the basin. Additional clearcut and partial cut opportunities exist in the remaining portions of the basin that are not planned for a complex future condition. Mixed conifer stands will be targeted for density management harvests. Regeneration structure over the next 10 years will come from harvesting hardwood-dominated stands, dense unmanaged conifer stands, and conifer stands that are showing signs of poor growth and/or symptoms of SNC.

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

### ***Tillamook Bay Basin***

The basin has a total of 13,202 acres, with state forest land consisting of 1,900 acres (14 percent) that drain directly into Tillamook Bay. This basin is not based on a 5th order watershed but contains the smaller creeks like Electric Creek, Patterson Creek and Doty Creek and lower portions of the Miami, Kilchis, and Wilson.

### **State Forest Land in the Basin**

Access to the basin from Highway 101 is by Patterson Creek and Electric Creek roads. Electric Creek, Patterson Creek, and Larsen Creek are the major streams draining this area.

The majority of the stands in this basin are either naturally regenerated stands more than 65 years old or plantations less than 40 years old. Past management consisted of planting, release, precommercial thinning, pruning, partial cutting, and clearcut. The basin is currently fragmented by past management, with some larger blocks of mature mixed conifer.

Recreation use in the Tillamook Bay Basin consists primarily of hunting, OHV use, target shooting, scenic driving, and some limited mountain biking use. The basin's close proximity to local communities contributes to a host of problems, including trash dumping and abandoned vehicles.

The basin is designated for limited motorized use in the Tillamook State Forest Recreation Action Plan 2000. OHV activity in the basin has been concentrated on the western portion adjacent to Bay City. The limited trail system is in poor condition. Soils in the western portion of the basin have high clay content and are prone to compaction and erosion. The motorized/non-motorized designation for this area is being reviewed.

Hunting use is high. Target shooting occurs year-round at landings, dead-end spurs, rock pits, and stockpiles. Trash and targets left behind by shooters are an issue. Local mountain bikers use the road system.

### **Key Resource Considerations**

- Marbled murrelet habitat is designated on 547 acres in this basin.
- A Bald eagle nest site is present.
- Core coho salmon areas are located within this basin.
- There are 2 miles of fish bearing (Type F) streams located on ODF ownership in this basin
- Several domestic water sources are located on or within 100 feet of state forest land.
- This entire basin is designated as Visual. Portions can be seen from either Garibaldi, Bay City, or Tillamook Bay and has a visual sensitivity rating of 1.
- The transportation system provides good access; a few spurs need construction and collectors/spurs will be assessed for road improvement; and the rest of the road system will be maintained as needed.

### **Landscape Design & Desired Future Condition**

Approximately 46% of this basin will be managed for OFS structure and an additional 2% will be managed towards LZR. The complex habitats designated in this basin are predominantly located in areas of known T&E sites and along portions of HWY 101 for scenic resources. Additional complex stands have been designated in mixed conifer stands more than 50 years old that are suitable for long-term retention, within stream adjacent stands, and within stands that provide connectivity to upland habitats.

### **Management Opportunities**

Harvest – Opportunities for regeneration and partial cut harvest are low. This basin has been well managed over the past 15 years and has a high percentage of plantations. The remaining portion of this basin consists of older mixed conifer stands that are in designated MMAs. Mixed conifer stands will be targeted for density management harvests. Regeneration structure over the next 10 years will come from harvesting hardwood-dominated stands, dense unmanaged conifer stands, and conifer stands that are showing signs of poor growth and/or symptoms of SNC.

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

## ***Wilson Basin***

The basin has a total of 77,830 acres, with state forest land consisting of 65,998 acres (85 percent). Other forest lands in the basin include industrial and non-industrial forest lands, and BLM lands.

### **State Forest Land in the Basin**

Wilson is the largest basin on the Tillamook District and main access is via Highway 6.

There are 6 large fish-bearing streams totaling 65 miles; N. Fork Wilson, Ben Smith, Cedar Creek, Jordan Creek, Little North Fork Wilson, and mainstem Wilson River. SAHs have been designated in the Little North Fork Wilson, Cedar Creek, and Ben Smith sub-basins.

Portions of an NSO cluster (Kilchis Cluster) are located in the lower basin and an NSO Activity Center is on BLM ownership in the lower basin influencing state land management. An MMMA is also located in the basin. Most stands in the basin are between 45 and 60 years of age and dominated by Douglas-fir or a Douglas-fir and alder mix. The lower portion of the basin has mixed conifer and hardwood stands that range in age from 60 to over 100 years old.

The Wilson Basin has the most recreation use in the district, including OHV use, camping, hiking, fishing, mountain biking, hunting, swimming, picnicking, kayaking, scenic driving, hang gliding, and para-sailing. Several developed recreation facilities are located in the basin, including the Tillamook Forest Center, Smith Homestead, Jones Creek Campground, Diamond Mill OHV Area, Jordan Creek OHV Staging Area, Keenig Creek Campground, and the Wilson River Trail. The basin has areas zoned for both non-motorized and motorized off-road use.

OHV use is the most popular year-round recreation activity. There are approximately 107 miles of designated, signed OHV trails in this basin on approximately 11 miles of designated non-motorized trails. Seven to ten organized OHV events are held each year in the Diamond Mill, Jordan Creek, and Cedar Creek sub-basins. OHV clubs regularly donate volunteer time and resources to install bridges, repair trails, and participate in monthly trail planning meetings.

The Tillamook Forest Center is in operation at its location on Cedar Creek Flat, near mile post 22 on the Wilson River Highway. The Center is expected to host more than 50,000 people per year, generating a large amount of automobile traffic at the site. The Smith Homestead Day Use Area, located ½ mile east of the Center, will also host many school groups, family activities, and other visitors.

Jones Creek Campground has over 4,000 registered campers per season. The day-use area remains open year-round and is used by swimmers, picnickers, hikers, kayakers, school groups, and highway travelers. Dispersed camping occurs throughout the basin but is concentrated in the Ben Smith, North Fork, Cedar Creek, and Jordan Creek sub-basins. Law enforcement activity has shifted largely to the dispersed camping areas.

Hiking and mountain biking are increasing in popularity as new trails are constructed and established trails rehabilitated.

Day use is very popular within the basin and is concentrated primarily along the Wilson River. The Wilson River Basin receives considerable fishing use. Fishing is mostly restricted to the main stem.

The Tillamook Ridge area is located close to Tillamook and has a high level of local use, including hunting, hiking, mountain biking, OHV use, hang gliding, and para-sailing.

### **Key Resource Considerations**

- There is a portion of an NSO cluster in the lower basin (1,980 acres), and an NSO Activity Center on BLM ownership, which influences a small portion of state forest land.
- Marbled murrelet habitat is designated on 271 acres.
- Tributaries to Wilson River are important salmonid spawning habitat. Core coho salmon areas are located within this basin. SAHs are designated in the Little North Fork Wilson River, Cedar Creek, and Ben Smith sub-basin encompassing 21,123 acres of Tillamook District.
- There are 109 miles of fish bearing (Type F) streams located on ODF ownership in this basin
- Several domestic water sources are located on or within 100 feet of state forest land.
- Approximately 23,255 acres of state forest land are designated as Visual. Many of these acres are visible from Highway 6 and have a visual sensitivity level of 1.
- There is heavy use of the basin's campgrounds, hiking trails, and OHV trails.
- There are dispersed camping sites through the basin
- The Tillamook Forest Center, Jones Creek Campground, Jordan Creek Staging Area, Keenig Creek Campground, Smith Homestead, and the Wilson River Trail are located in this basin
- There is 107 miles of motorized trails and 11 miles of non-motorized trails in the Wilson Basin
- The transportation system provides limited access; access to some areas is good but some large areas need access developed. The rest of the road system will be maintained as needed.

### **Landscape Design & Desired Future Condition**

Approximately 35 percent of this basin will be managed for LYR and OFS stand structures. Complex stand structures will be located along most of the headwaters and main stem of the Wilson River which includes Cedar Creek and Little North Fork of the Wilson, the West Fork of the North Fork of the Wilson, Jordan Creek, and South Fork Jordan Creek. The majority of the OFS stands will be located along the Little North Fork of the Wilson River and within the designated owl cluster.

## **Management Opportunities**

Harvest – Opportunities for both partial cut and regeneration harvest are moderate to high. It is anticipated that there will be slightly higher levels of regeneration harvesting during this planning period than over the past 10 years. Mixed conifer stands and stands designated as complex will be targeted for density management harvests. A minor amount of regeneration harvest will be done in DFC complex to help move some stands towards a complex condition within the basin. Regeneration structure over the next 10 years will come from harvesting hardwood-dominated stands, dense unmanaged conifer stands, and conifer stands that are showing signs of poor growth and/or symptoms of SNC.

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

## ***Tillamook River Basin***

The basin has a total of 38,917 acres, with state forest land consisting of 3,460 acres (9 percent). Most land in the basin is industrial forest land.

### **State Forest Land in the Basin**

The main access for this basin is Munson Creek Road and Simmons Ridge Road. A MMMA has been designated in the Southwest portion of the basin. Fawcett Creek and Simmons Creek are large fish-bearing streams within the basin. The City of Tillamook Watershed (Skookum Lake) affects approximately 1,500 acres of state forest land. The majority of the stands in this basin are either naturally regenerated stands more than 65 years old or plantations less than 40 years old. At present minimal recreation management occurs in this basin. Efforts are directed at inappropriate dispersed camping, illegal dumping, and four-wheel drive abuse.

Approximately 40 percent of this basin will be managed for OFS and LYR stand structures. Complex stand structures will provide increased protection to most of the headwaters of Fawcett Creek and Skookum Lake which feeds into the City of Tillamook municipal water supply. OFS stands will be located along Fawcett Creek and within the MMMA.

### **Key Resource Considerations**

- There are 401 acres designated as MMMA's
- Core coho salmon areas are located within this basin.
- There are 8 miles of fish bearing (Type F) streams located on ODF ownership in this basin
- Several water sources are located on or within 100 feet of state forest land.
- Wells for the City of Tillamook municipal water system are located in the basin.
- Approximately 774 acres of state forest land are designated as Visual. Many of these acres are visible from Highway 101 and the city of Tillamook and have a visual sensitivity level of 1.

- The transportation system provides good access; construction of a few spurs and some road improvement are all that are needed.

### **Landscape Design & Desired Future Condition**

Approximately 40% of this basin will be managed for complex stand structures; the majority of this is designated as OFS. The OFS stands are located in known T&E sites and along important streams along Fawcett Creek. The Tillamook River basin will provide a range of habitat types, with complex habitats generally less than 500 acres. The basin will be fragmented, with complex habitats located in the mixed conifer stands more than 50 years old that are suitable for long-term retention, and in vigorous mixed conifer stands.

### **Management Opportunities**

Harvest - The portions of the North Fork Nehalem that are designated as LYR or OFS will be managed towards complex condition and will have no clearcuts and very limited amounts of partial cutting done within the basin. Both clearcut and partial cut opportunities exist in the remaining portions of the basin that are not planned for a complex future condition. Mixed conifer stands will be targeted for density management harvests. Regeneration structure over the next 10 years will come mainly from stands less than 50 years old that are showing signs of poor growth and/or SNC. Other candidates for regeneration structures will come from hardwood stands.

Transportation - This basin is a low priority for transportation planning and/or investments in the infra-structure. Road construction and improvement will be completed at a lower rate than was done in the last ten years.

## ***Trask Basin***

The basin has a total of 85,481 acres, with state forest land consisting of 56,380 acres (66 percent). Both private industrial and federal forests are in this basin.

### **State Forest Land in the Basin**

The mainline roads or high use roads in this basin are the North, East, and South Fork Trask roads, Toll Road, and Bark Shanty Road. There are approximately 58 miles of fish-bearing streams in the basin, and the major sub-basins are North, East, and South Forks of the Trask River. SAHs are designated in the Elkhorn and East Fork of the South Fork Trask River. A small portion of the Kilchis Cluster falls within the lower Trask basin, to create connectivity of NSO habitat on the district.

The stands are dominated by Douglas-fir and range from 35- to 55-years old and many mixed conifer plantations less than 40 years old. There are pockets of older conifer stands in the upper portion of the basin, which have had multiple entry thinnings.

Recreation activities in the Trask Basin include hunting, OHV use, fishing, dispersed camping, day use, hiking, equestrian use, mountain biking, kayaking, and scenic driving. The Trask Basin is popular with local residents and accessed from the upper end by users from the Willamette Valley. The basin offers scenic river canyons, rolling forested hills, and

a few high peaks. The basin is zoned for motorized off-road use. Hembre Ridge, Gobblers Knob, and Gold Peak offer scenic vistas, and Cruiser Creek Falls can be accessed easily from Cruiser Creek Road. Lake Tahoe, a four-acre impoundment, offers stocked trout fishing and has potential for trail and day-use development. The basin has been a popular OHV trail riding area for over forty years, and currently has a moderate level of use.

Areas of special focus include Stones Road boat launch; Peninsula Park boat launch and trail; Hollywood Camp, a well-used dispersed camping area and staging area; and Trask Park, a 100-site campground and day-use area on state forest land that is managed by Tillamook County through an agreement with the Department of Forestry.

### **Key Resource Considerations**

- The adjacent private industrial forest land to the west is managed on short rotations, with the majority of the land in REG and CSC structures.
- The adjacent BLM ownership to the south is managed as a LSMA.
- Portions of the Kilchis Owl Cluster fall within the Trask Basin.
- Coho salmon core areas are located in the North Fork, South Fork, and East Fork of the Trask River. SAHs are designated in the East Fork of the South Fork Trask and Elkhorn sub-basin encompassing 19,867 acres of Tillamook District.
- There are 102 miles of fish bearing (Type F) streams located on ODF ownership in this basin
- Several domestic water supplies are located on or within 100 feet of state forest land.
- The original route of the Trask Toll Road (historical transportation route dating from 1873 to 1911) runs through this basin. It has recently been inventoried, evaluated for protection classification and marked. These markers will be preserved during any operations along with those sections of original road bed determined to be Class 1 cultural resource sites.
- Adjacent BLM land north of the Nestucca River is managed to limit OHV use and trail development to existing roads and trails.
- Recreation use is considerable and varied.
- There are 64 miles of motorized trails and 1 mile of non-motorized trails within the Trask Basin.
- Approximately 409 acres in this basin are designated as Visual.
- The transportation system provides limited access; access to some areas is good but some large areas need access developed. The rest of the road system will be maintained as needed.

### **Landscape Design & Desired Future Condition**

Approximately 19 percent of this basin will be managed for OFS and LYR stand structures. Complex stand structures will be primarily located along the East Fork Trask River and North Fork Trask River. Additional areas being managed for complex structure include

stands of mixed conifer that are currently LYR or will be within 20 years. The majority of the designated OFS stands are currently in a LYR stand structure.

### **Management Opportunities**

Harvest – Opportunities for both partial cut and regeneration harvest are high. It is anticipated that there will be slightly higher levels of regeneration harvesting during this planning period than over the past 10 years. Mixed conifer stands and stands designated as complex will be targeted for density management harvests. A minor amount of regeneration harvest will be done in DFC complex to help move some stands towards a complex condition within the basin. Regeneration structure over the next 10 years will come from harvesting conifer stands that are showing signs of poor growth and/or symptoms of SNC, hardwood-dominated stands, and dense unmanaged conifer stands.

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

### ***Nestucca Basin***

The basin has a total of 139,895 acres, with state forest land consisting of 7,547 acres (5 percent). Federal forest lands in this basin total over 89,000 acres (64 percent).

#### **State Forest Land in the Basin**

Access to this basin varies due to the scattered parcels. Many lands are accessed via East Beaver Creek Road and Nestucca River Road. Many of the roads in this basin are managed by USFS or BLM and improved through agreements or permits for state forest harvest activities.

State forest management has little impact on the Nestucca River, but does influence the Clarence Creek and East Creek sub-basins. State forest land in the basin is mostly Douglas-fir with small pockets of hemlock.

#### **Key Resource Considerations**

- Approximately 64 percent of the basin is federally owned (USFS and BLM), with the majority managed as LSMA and Timber Management Areas (TMAs).
- NSO Activity Centers have been designated on BLM land in Moon Creek and East Beaver Creek area and influence management on ODF land.
- Core coho salmon areas are located within this basin.
- There are 6 miles of fish bearing (Type F) streams located on ODF ownership in this basin
- Several domestic water supplies are located on or within 100 feet of state forest land.
- Approximately 1,107 acres in this basin are designated as Visual.

- The transportation system provides good access; a few spurs need construction and collectors/spurs will be assessed for road improvement; and the rest of the road system will be maintained as needed.

### **Landscape Design & Desired Future Condition**

Approximately 25 percent of this basin will be managed for OFS and LYR stand structures. The majority of the complex structure is designated in the Moon Creek owl circle. Additional stands Complex stands will be managed within certain older stands and within stands adjacent to streams. Additional complex stands have been designated in mixed conifer stands that are suitable for long-term retention, within stream adjacent stands, and within stands that provide connectivity to upland habitats and BLM ownership.

### **Management Opportunities**

Harvest –This basin has a low level of harvest opportunity mainly because of the small amount of acres. Due to the high level Desired Future Condition – Complex and T&E restrictions in this basin, the majority of harvest opportunities will be partial cut prescriptions. A few regeneration harvest opportunities exist on those acres not designated as DFC – Complex.

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

### ***Little Nestucca Basin***

The basin has a total of 33,783 acres, with state forest land consisting of 791 acres (2 percent) in scattered parcels. Federal ownership is over 17,000 acres (51 percent).

### **State Forest Land in the Basin**

Access to this basin varies due to the scattered parcels. Most of the state land is accessed by Highway 22 at Sourgrass summit.

State forest lands have very little influence on the Little Nestucca River. Stands are dominated by Douglas-fir, with 80 percent of the stands less than 30 years old. The basin's forests are mostly in two age classes: less than 30 years old and over 50 years old.

### **Key Resource Considerations**

- Approximately 75 percent of the basin is federally owned.
- Private and USFS land surround state forest parcels.
- There is an NSO Activity Center in the Van Duzer Corridor (OPRD land) within two miles of the largest parcel of state forest land.
- Core coho salmon areas are located within this basin
- There are 3 miles of fish bearing (Type F) streams located on ODF ownership in this basin
- Approximately 527 acres in this basin are designated as Visual.

- The transportation system provides good access; a few spurs need construction and collectors/spurs will be assessed for road improvement; and the rest of the road system will be maintained as needed.

### **Landscape Design & Desired Future Condition**

Approximately 62% of this basin will be managed for OFS and LYR stand structures. The majority of the complex structure is designated in the Van Duzer owl circle. Additional stands that are designated as complex have been located in mixed conifer stands that are suitable for long-term retention, within stream adjacent stands, and within stands that provide connectivity to federal ownership.

### **Management Opportunities**

Harvest –This basin has a low level of harvest opportunity mainly because of the small amount of acres. Due to the high level Desired Future Condition – Complex and T&E restrictions in this basin, the majority of harvest opportunities will be partial cut prescriptions. A few regeneration harvest opportunities exist on those acres not designated as DFC – Complex.

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

# Expected Outputs and Habitat Achievements

## Structure Targets, Timber, and Habitat Outputs

### Structure Targets and Harvest Outputs

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

The strategies used to develop snags and down wood will vary according to tree size, age, species, and type of management activity. In first entry commercial thinnings (generally between ages 25 and 40), no prescriptions will be used to develop snags and down wood, as trees this size do not make long-lasting snags or down wood. Some of the trees left in the partial harvest will naturally become snags, due to top breakage. In older partial cuts, if pre-harvest stand examinations do not indicate sufficient numbers of snags, then some trees may be created into snags. Harvest prescriptions may also be needed to provide sufficient down wood in these older thinnings. In clearcuts, to obtain the objective of 2 snags and 600 to 900 cubic feet of down wood per acre, pre-harvest estimates and harvest prescriptions must be used to assure these levels are attained.

In hardwood stands and small diameter conifer stands, it is often difficult to meet the down wood and snags requirements after the operation. Therefore, a variety of methods must be used to contribute to the FMP landscape targets. One method that will be used includes leaving additional green trees in the harvest units to provide these structures over time. Other methods include creating down wood and snags in adjacent areas that are constrained from harvesting or by increasing levels in other harvest units. All of these methods will contribute to the landscape level objectives which will be achieved over time, but not necessarily in every individual harvest unit.

**Table 11. Anticipated Percent Stand Structure Development by 2010<sup>5</sup>**

	REG	CSC <sup>2</sup>	UDS <sup>3</sup>	LYR <sup>4</sup>	OFS
<b>Current Condition</b>	8	9	76	5	1
<b>After Implementation Plan Period<sup>1</sup></b>	17	12	59	10	1
<b>Desired Future Condition</b>		←—59	—→	20	20

1. These are estimates based on an average of 2,900 acres of CC/year & 1100 acres of PC/year.
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 10 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; and development of trees greater than 32 inches in diameter.
5. The percentage for all stand structures does not equal 100% because 1% of the district is designated as Non-Silviculturally Capable or Non-Forest.

## **Harvest Outputs**

The Annual Harvest Objects (AHO) in Table 11 identifies the sustainable and predictable production of timber (forest products) from the district and the harvest activities “for the ten-year period that will be necessary to move toward the desired future condition” (NW FMP page 5-4). The AHO for this period has been determined through the District Opportunity Analysis described in Appendix A. The Opportunity Analysis determined that 47 MMBF is the maximum sustainable volume that can be produced to meet the goals of the Northwest Oregon State Forest Management Plan as applied through this Implementation Plan. The acre ranges for clearcut (Regeneration Harvest) and partial cut harvest describe the types of harvest activities that will occur over time to achieve the volume objective and desired future condition of stand structures. See Table 12 for anticipated stand structure development by 2019.

The AHOs will be implemented through the district’s Annual Operations Plan. The volume harvest proposed in each Annual Operations Plan will be within 5 percent of the AHO volume objective and over time the Annual Operations Plans will average the AHO. The acres of clearcutting and partial cutting proposed in each Annual Operations Plan will normally be within the ranges identified in Table 11, but the mixture of acres will vary from year to year based on the stands selected for harvest, their current condition, desired future condition, and the silvicultural prescription used to move the stand from its current to its future condition. Numerous factors apply to the stand selection process and their relative importance may change from year to year and from basin to basin. Factors that affect the stand selection process include the overall objectives identified in this Implementation Plan, recent harvest activity in the basin, results of threatened and endangered species surveys, condition of the transportation system, and current market conditions.

It is intended that the harvest activities proposed in the Annual Operations Plans be consistent with the AHO identified here; however, unforeseen, transitory events may result in an Annual Operations Plan that falls outside of the AHO. These transitory events may consist of catastrophic windstorm or fire that result in emergency salvage operations, resulting in harvests above the AHO, or an extreme down turn in market conditions that do not support the AHO volume or specific silvicultural prescriptions. When events necessitate an exception to the AHO, the Annual Operations Plan will indicate that an exception is being made and the reason behind the exception.

If conditions indicate the Annual Operations Plan will not be consistent with the AHO for two or more consecutive years, or new information or strategies indicate a shift in the AHO, this Implementation Plan will be revised. There are two processes for revisions to the Implementation Plan: major or minor. Page 5-4 of the Northwest Oregon State Forest Management Plan defines a major revision (of the AHO) as:

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

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

**Table 10. Annual Harvest Objective, Volume and Acres**

Volume (MMBF)	Clearcut (Regeneration Harvest) Acres	Partial Cut Harvest Acres
47	800-3,150	850 - 3,450

# Appendix A

## District Opportunity Analysis

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

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

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

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

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

### Harvest Scheduling Model

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

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

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

#### Harvest Context

- There is a significant difference (reduction) in this model run as compared to the four year AOP average for two main reasons. First, the State Forester directed the district to prepare the 2005 and 2006 AOP's at the high end of the volume range (78.7 MMBF). Second, the district was directed to prepare the 2007, 2008, and 2009 AOP's based on a new model run which included a departure from a non-declining even flow of volume resulting in an AHO of 60 MMBF. The Implementation Plan volume is approximately 6 % lower than the modeled volume due to volume adjustments made for FMP requirements to protect Potential Debris Flow Track Streams, Inner Gorge areas, High Landslide Hazard Locations, High Energy Streams, etc. The district believes that the new model volume output (47 MMBF) per year can be implemented given the acreage ranges displayed in Table A-1.

**Table A-1. Harvest Outputs**

	Model Outputs <sup>1</sup>	AOP Average 2005 through 2009	Implementation Plan <sup>2</sup>
Volume (MMBF)	50	66	47
Regeneration Harvest Acres	2,078	3,255	1,975 800 – 3,150
Partial Cut Harvest Acres	1,069	1,952	2,150 850 – 3,450
Total Acres	3,147	5,207	4,125 1650 – 6,600

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

2. Annual harvest levels from the implementation plan March 2009. The top number is the mid-point of the range and the lower numbers are the range of outputs. The volume was calculated from the model output (IP Revision Harvest Model H&H 7) minus the NetMap adjustments for the first two periods (See the Other Factors Affecting Implementation for more information)

The average harvest volumes per acre shown in Table A-2 below summarizes the difference in volumes produced in the model solution and the volumes calculated through timber cruise and harvest data. The volume per acre of stands harvested by the model is higher than the actual per acre harvest on the district for the last ten years. However, actual Regeneration Harvest and Partial Cut volumes per acre can easily fluctuate plus or minus 10 percent based on the stands selected for any given AOP.

**Table A-2. Average Harvest per Acres**

	Model <sup>1</sup>	Actual <sup>2</sup>	Difference	Percent
Regeneration Harvest	16.6	13.9	2.7	16.3
Partial Cut Harvest	12.3	10.9	1.4	11.4

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

Other Factors Affecting Implementation

**Slope/Stream Issues:**

- High Landslide Hazard Locations: The district reviewed planned and completed sales and noted areas not harvested due to High Landslide Hazard Locations (HLHL). The spatial data in the model was updated to reflect these known HLHL sites and designated the sites as non-harvestable. While the district was able to map known sites, the unknown sites were not modeled.
- Type N Seasonal Potential Debris Flow/High Energy Steams: These are treated similar to HLHL sites. The model has rules to create buffers as found in the FMP Appendix J, but the spatial data lacks identification of these Type N Seasonal streams on the Tillamook District. Potential debris flow and high energy streams are usually identified through field work and site specific reviews. The model under-predicts the number of potential debris flow streams found in the district because it under-predicts the amount of steep topography. The affected streams would require no-harvest buffers of 25' on either side of their channels. Better mapping and prediction of these types of streams will reduce the amount of operable acres currently indicated by the model.
- Inner Gorge: These are also treated similar to HLHL sites. The inner gorge areas are usually identified through field work and site specific reviews. The model does not capture these features for the same reasons it under-predicts the number of potential debris flow streams. The identification of inner gorge buffer areas will also reduce the number of operable acres currently indicated by the model.


In order to spatially identify and quantify the factors outlined above, the district used the NetMap Model tool to estimate the percent reduction to apply to the Annual Harvest Objective (AHO). Each of these factors was modeled and the NetMap estimates were subtracted from the model outputs. This resulted in a 6% volume reduction to compensate for the no-harvest requirements outlined in the FMP for each of the factors listed above. Therefore the model output of 50 mmbf referred to in Table A.1 is reduced to the Implementation Plan level of 47 mmbf also referred to in Table A.1.

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

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

### Implementation

The Annual Harvest Objectives for the implementation plan are 47 MMBF on 1,975 acres of Regeneration Harvest and 2,150 acres of Partial Cut. These acreages represent the mid-point of the ranges shown in Table A-1. Annual Harvest Objective acreage ranges were set assuming a minimum of 20 percent of the AHO volume will include either partial cut or regeneration harvest.



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# Appendix B

## References

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# Map Section

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