



COOS DISTRICT (ELLIOTT STATE FOREST) IMPLEMENTATION PLAN November 2011

This Implementation Plan describes the management approaches and activities that Coos District (Elliott State Forest) will pursue in order to carry out the *Elliott State Forest Management Plan* (FMP). The Elliott State Forest Implementation Plan (IP) guides forest management for all forest resources on Coos District for a ten year period starting January 1, 2012.

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Executive Summary

The 2011 Implementation Plan (IP) for the Oregon Department of Forestry (ODF) Coos District provides detailed information on implementation of the Forest Management Plan (FMP). This IP describes the current stand structure amounts and distribution on the district and the specific management activities, outputs, and achievements anticipated for the next ten-year period. The goal for Common School Forest Lands (CSFLs) is the maximization of revenue to the Common School Fund (CSF) over the long term, consistent with sound techniques of land management. The goal for management of Board of Forestry Lands (BOFLs) is to secure the greatest permanent value to the citizens of Oregon by providing healthy, productive, and sustainable forest ecosystems, that over time and across the landscape provide a full range of social, economic, and environmental benefits to the people of Oregon.

The goal of the FMP is to provide management direction for all CSFLs and BOFLs managed by the Coos District. This includes the Elliott State Forest (93,003 acres), as well as scattered tracts (2,270 acres) of state forest lands in Coos, Curry, and Douglas Counties, totaling 95,273 acres. The FMP takes a comprehensive, multi-resource approach to forest management. The resource management goals and strategies are intended to achieve a proper balance among the resources through a system of integrated management.

History

The Elliott State Forest (ESF) is Oregon's first state forest created in 1930 as the culmination of a vision by the first State Forester - Francis Elliott – and Governor Oswald West to trade the scattered CSFL parcels inside the National Forests with the federal government for one large block of federal land. The BOFLs were acquired in the 1930's and 1940's when Coos and Douglas counties deeded tax-delinquent forest land to the State in return for two-thirds of the revenue from these lands. Formal management on the ESF began in the 1950's and was accelerated after the 1962 Columbus Day windstorm to salvage an estimated 100 million-board-feet of wind-throw timber.

The 1980's were characterized by a growing concern about the northern spotted owl and the marbled murrelet, both listed as federal threatened species in 1990 and 1992 respectively. As a result of these listings, a new FMP was approved in 1994 and a Habitat Conservation Plan (HCP) was approved in 1995. In conjunction with the HCP, the U.S. Fish and Wildlife Service (USFWS) issued the ODF a 60-year Incidental Take Permit (ITP) for the northern spotted owl, and a six-year ITP for the marbled murrelet. The later permit expired on October 3, 2001, and was the prime driver for the revision of the 1994 FMP and 1995 HCP. Revision of the 1994 FMP and 1995 HCP began in 2000. After a ten-year planning process, the ODF, Department of State Lands (DSL), USFWS and the National Marine Fisheries Service were unable to agree to a HCP that would be consistent with the CSFL mandate and meet the federal issuance criteria for ITPs. As directed by the State Land Board and the Board of Forestry in 2010, the ODF developed a "take-avoidance plan" by modifying the draft 2006 FMP to accommodate a take-avoidance approach.

The Implementation Plan

This Plan describes the management approaches and activities that the Coos District will pursue in order to carry out the FMP. The Plan guides forest management for all forest resources on Coos District for a ten-year period. The Plan identifies the physical elements, biologic elements, and human uses that affect management approaches and activities on the Elliott State Forest.

This Plan recognizes the need for adaptive approaches to management in which the outcomes of management actions are measured and compared to stated objectives. Changes in management activities or goals are made when necessary. This approach requires a commitment to long-term information gathering and the incorporation of that information into the decision-making process.

This Plan achieves a sustainable harvest level by implementing the following strategies of sustainable Forest Ecosystem Management as defined in the FMP:

- Actively manage for a diversity of stand structures. The FMP identifies three structure types with expected ranges over time: 10-20 percent early structure; 30-60 percent intermediate structure; and 30-50 percent advanced structure.
- Manage conservation areas to protect special resources and avoid take of Threatened and Endangered (T&E) species,
- Actively manage to provide key legacy structural components,
- Actively manage for a diverse and healthy ecosystem applying the principles of integrated pest management, and
- Manage aquatic and riparian systems to achieve a range of desired future conditions. Management standards include site-specific provisions for establishing 160-foot RMAs, and describe how management will occur in these areas. Because vegetation in the near stream area has a relatively greater role in supporting riparian functions and processes, a high priority is placed on management decisions in this area. For example, if mature forest conditions exist within 100 feet (inner zone) of Type F and Large and Medium Type N streams then no management will take place in this zone. Additional trees will be left beyond 100 feet to comply with all leave tree requirements for the full riparian management area. In general this will result in at least 100 foot no-harvest zones along all Fish and Large and Medium Non-fish streams when mature forest conditions exist. If mature forest conditions do not exist and forest management would expedite the development of mature forest conditions, then FMP standards will guide management decisions so that properly functioning riparian and aquatic conditions will be created over time.

Anticipated Harvest Levels and Results

Current resource information and the goals and strategies of the FMP were integrated into a forest model to determine the harvest schedule for the Plan period. Model outputs were reviewed by foresters with on the ground knowledge of the Elliott State Forest. The actual location and distribution of management activities will be dependent on the annual results of T&E surveys and the application of T&E policies. Surveys for owls and murrelets will continue in and around proposed harvest operations in accordance with State Forests Operational Policies for these species. Harvest units will be planned to avoid protected areas such as Marbled Murrelet Management Areas, slopes affected by public safety considerations, inner zones of riparian areas, and suitable owl habitat within owl circles needed to avoid “take”.

- The projected harvest for this Plan is 35 - 45 million-board-feet per year. An average yearly harvest of 40 million-board-feet per year is anticipated.
- The current amount of advanced structure on the forest is approximately 43 percent. Under this Plan, advanced structure is expected to remain within the 30-50 percent range as described in the FMP. Modeling indicates that by the end of this Plan, advanced structure on the forest will be between 39 and 42 percent.

A public review and comment period will be provided prior to this plan being approved.

1. Introduction

The Coos District Implementation Plan guides forest management for all forest resources on the Coos District beginning January 1, 2012. This implementation plan describes the management approaches and activities that the Coos District will pursue in order to carry out the Elliott State Forest Management Plan (FMP). In addition, the management activities conducted under this plan will be consistent with the following State Forest Operational Policies and strategies:

- Northern spotted owls
- Marbled murrelet
- Reforestation and Young Stand Management
- Annual Operation Plan
- T&E Plants
- Swiss Needle Cast Strategic Plan
- Forest Roads Manual
- And other operational policies as they become approved

The specific operations and management activities necessary to carry out this implementation plan will be described in the Annual Operations Plans, beginning with the *2013 Coos Annual Operations Plan (AOP)*. Sales from AOPs prior to the 2013 AOP will be completed consistent with this Ten Year Implementation Plan and all operational policies.

2. District Overview

Land Ownership

The Elliott State Forest (ESF) is located in the Oregon Coast Range. Other managed lands include scattered tracts in the Coast Range in Coos and Douglas counties and in the Klamath Mountains in Curry County. Coos Bay and North Bend are the nearest cities to the southwest of the ESF, with Reedsport the nearest town to the northwest. The ESF is a contiguous block of land approximately 18 miles long (north to south), and approximately 16 miles wide (west to east). The Umpqua River is located immediately north of the forest. To the west, the ESF extends within six miles of the ocean. On the east, it extends approximately 21 miles inland. The contiguous ESF covers approximately 93,000 acres, located within Coos and Douglas Counties.

In addition to this main block of land, the Coos District manages approximately 2,270 acres of scattered Common School Forest Lands (CSFLs) located in Coos, Curry, and Douglas

Counties. These scattered tracts are distributed across a broad geographic area ranging from the California border to just north of the Umpqua River. Approximately 91 percent of the state forest lands in the ESF are CSFLs, owned by the State Land Board; the remaining 9 percent are Board of Forestry Lands (BOFLs), owned by the Board of Forestry (BOF). Table 1 shows the Coos District acres by County and Ownership.

Table 1. Coos District Acres, by County and Ownership

County	BOFLs	CSFLs	Total Acres
Coos	7,151	52,974	60,125
Douglas	1,755	32,647	34,402
Curry	0	746	746
Total Acres	8,906	86,367	95,273

Land Management Classification System

The Oregon Department of Forestry (ODF) Forest Land Management Classification System (LMCS) acreage breakdown is presented in Tables 2 and 3. Table 2 shows the classified acres in each of the three stewardship classes. Table 3 shows the acres in both the Focused Stewardship and Special Stewardship subclasses. The conservation areas defined in the Forest Management Plan have been classified as either Focused or Special Stewardship, depending on the specifics of the management strategy. Wildlife Habitat LMCS include Marbled Murrelet Management Area's¹ (MMMA) and owl circle² conservation areas. The Inner and Outer Aquatic and Riparian Zones are classified as Special and Focused Stewardship, respectively. The Steep, Unique and Visual (SUV) conservation areas have been classified as Special Stewardship in various subclasses.

The LMCS 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. For example, the subclasses of Aquatic and Riparian Habitat, and Visual, can occur at the same point on the landscape. Also, overlapping classifications cause the double counting of acreage. As a result, when the acres shown in Tables 3 are totaled, the total is greater than the actual number of acres in the district. Table 1 shows the actual acres in the district.

¹ Marbled Murrelet Management Areas are part of the take avoidance strategies described in the State Forests Operational Policy for Marbled Murrelets. They are established when a stand is determined to be occupied by marbled murrelets through surveys and they average 209 acres in size.

² Owl circles are established around a northern spotted owl activity center in accordance with the State Forests Operational Policy for Northern Spotted Owls. An owl circle is composed of three zones (a core area, the inner or 0.7 mile radius circle, and the outer or 1.5 mile radius circle) and each zone has different protection requirements.

Table 2. Coos District Acres, by Stewardship Class and Fund

Classification	BOFLs	CSFLs	Total Acres
Special Stewardship	2,120	17,680	19,800
Focused Stewardship	5,203	50,483	55,686
General Stewardship	1,583	18,203	19,787
Total Acres	8,906	86,367	95,273

Table 3. Coos District Acres, Focused and Special Stewardship Subclasses

Resource	Focused Stewardship	Special Stewardship
Administrative Sites	-	-
Aquatic and Riparian Habitat	7,040	6,274
Cultural Resources	1	-
Deeds	-	-
Domestic Water Use	21	-
Easements	-	3
Energy and Minerals	-	-
Grazing	99	
Operationally Limited	-	2,978
Plants	1	487
Recreation	5	-
Research/Monitoring	57	
Transmission	-	11
Visual	2,492	68
Wildlife Habitat	72,550	11,980
Total Acres	82,266	21,801

History

[Excerpts from the *ESF Management Plan*.]

The ESF has the honor of being Oregon’s first state forest. Officially established in 1930, today it is well known for producing high-quality timber, habitat for fish and wildlife species, and recreational opportunities.

Prior to its official creation, the ESF was national forest land administered by the U.S. Forest Service (USFS). All other non-federal forests in Oregon were predominantly owned by private landowners.

Two catastrophic events in Oregon over the past 150 years have affected the ESF: the Coos Bay Fire of 1868, and the Columbus Day Storm of 1962. However, the healthy, growing forest and thriving wildlife populations that exist today demonstrate the ESF's ability to recover from catastrophic disturbances. Despite the fire and windstorm, the ESF currently has the oldest timber stands found in any of Oregon's state-owned forests.

Native Americans, including the Coos and Umpqua tribes, originally lived in and near the area that is now the ESF (Beckham 2001). Trappers were the earliest Euro-American presence, moving up and down the coast between northern California and Fort Clatsop in Astoria, Oregon from the 1820s to the 1840s.

Early descriptions of the ESF area mention vast stands of Douglas-fir, western hemlock, western red cedar (*Thuja plicata*), Port Orford cedar (*Chamaecyparis lawsoniana*), and large stands of Sitka spruce. Settlers mentioned stands of red alder (*Alnus rubra*), willow (*Salix spp.*), and maple (*Acer spp.*) along the rivers and streams.

The earliest known fires in the Elliott area include two large fires of unknown size, one along the Elliott's eastern edge in 1770, and the other along the northeast portion of the ESF in 1840. These fires left untouched most of the area that is now the ESF.

In contrast to the earlier fires, the historic Coos Bay Fire of 1868 burned 90 percent of the area that is now the ESF. It is believed that this fire started near Scottsburg from a settler's clearing fire, in an area known as Greenacres. The fire burned westward along the north bank of the Umpqua River until it jumped the river near the mouth of Mill Creek. From there, it blazed in a southwesterly direction, burning nearly all of the ESF area except for the southeast portion and small parts of the northwest portion.

The origin of the ESF dates back to 1859, when the Oregon Territory became the State of Oregon. At that time, the Admissions Act granted to Oregon two sections (16 and 36) in every township, or equivalent lands if those were unavailable, for the financing of public schools. This land grant, known as the Common School Trust Lands, comprised approximately 3.5 million acres.

To turn the isolated parcels of CSFLs into one manageable block of state-owned forest land, State Forester Francis Elliott and Governor Oswald West decided to trade the CSFL parcels inside the national forests with the federal government for one large block of federal land. This block of land became Oregon's first state forest.

The new ESF was to be managed as a demonstration forest, to show private landowners the value of investing in forest management. However, the year the ESF was officially dedicated, 1930, was the first year of the Great Depression. Although the Oregon Legislature placed the State Forester in charge of administering the forest, he was given no funds to complete the work. Despite the forest's potential to produce timber, formal management did not commence until later.

In 1940, Coos County deeded to the BOF 6,500 acres of tax-delinquent forest land located next to the ESF. Nearly 1,800 acres of BOFLs are also located in Douglas County, most of which was deeded by the county in the 1930s and 1940s. In return, the counties were to receive two-thirds of the revenue from these lands.

Before the 1950s, the timber market was sluggish, and timber prices remained low. The ODF facilitated only two timber sales, at the request of a mill owner who paid approximately \$2 per thousand board feet (MBF) for stumpage. By the end of World War II, demand and prices for timber increased significantly.

In 1962, the historic Columbus Day Storm had a major effect on the management of the ESF. In just a few hours, the storm's high winds blew down an estimated 100 million board feet (MMBF) of timber. Most of the blowdown was in the western half of the forest, where few roads existed because the trees were younger. Salvaging the timber before it rotted required the building of many miles of roads at a hectic pace. Nearly one-third of the 550 miles of road that exist today in the forest were built at that time to obtain the blowdown timber. Foresters cut an additional 200 MMBF of timber to access the blowdown, increasing the total to 300 MMBF of timber harvested in a short amount of time.

In 1968, the Coos District was managing the 85,000-acre ESF and another 11,000 acres in scattered isolated state parcels. A focused land exchange effort began in the 1970s, in which many of these isolated parcels were traded for privately owned land within or next to the forest. A total of 7,000 acres of CSFLs was added to the main block of the ESF, resulting in a contiguous forest that is easier to manage.

Physical Elements

[Excerpts from the *ESF Management Plan*.]

Geology and Soils

The ESF is located in the southern portion of the Oregon Coast Range physiographic province. Formation of the rocks which comprise this portion of the Coast Range began during the early Eocene period, approximately 50 million years ago. A deep marine basin was located at the position of the ESF at that time. To the south was a shallow off-shore shelf which received large quantities of fine grained (sand to silt sized) sediment from the mouth of a large river system that drained the ancient Klamath Mountains located at the basin's southern end. The Tyee sandstone/siltstone formation, which underlies most of the ESF, is believed to have formed from these massive sub-marine landslides that dislodged the shelf sediments. As these sediments settled to the ocean floor, the heavier sand particles were deposited first and then were covered by lighter finer silt and particles. Over the course of many cycles of this settling process, the layered siltstone over sandstone rock that is visible in many of the deeper road cuts in the ESF were formed. Subsequent periods of, tectonic uplift, sea-level changes, and erosion have created the landforms visible in the ESF today.

Topography

The topography in the ESF is generally rugged and highly dissected with steep, narrow canyons, although the southeast part of the forest is less steep. The dissected landforms contain many ridges and swales. Across the forest, slopes face in all directions, with no dominant exposure. Elevations range from near sea level to 2,100 feet above sea level.

Surface Water

Water bodies in the ESF drain into three major basins. The eastern and northern portions of the forest drain into the Umpqua River. The west side of the forest drains into the Tenmile Lake system. The West Fork Millicoma runs through the center of the forest towards the south and is part of the Coos River system. The ESF contains parts of two lakes. Loon Lake, a popular recreation site has approximately 1 mile of shoreline in the ESF. Elk Lake, also known as Gould's Lake is a small pond located within the ESF on Elk Creek. Outside the ESF, Tenmile Lake is influenced by waters draining from the forest.

Climate

The ESF has a strong maritime influence from the nearby Pacific Ocean. As a result, temperature fluctuations are relatively moderate and rainfall amounts are high. The mean minimum January temperature in the ESF is approximately 32° F and the mean maximum July temperature is 76° F.

Recorded rainfall varies across the ESF, averaging 65 inches per year at lower elevations on the western edge of the forest, and 115 inches per year on the high, interior ridges. Rainfall declines slightly on the eastern side of the ESF, to 90 inches per year. Snowfall in the forest is normally light to moderate, both in amount and duration of the snow. There is no residual snowpack.

Natural Disturbance

Forests along the Oregon Coast, including the ESF, result from a typical progression of stand structures following large, relatively infrequent disturbance events and subsequent smaller, more frequent disturbances. Relatively recent, large-scale events—such as the Coos Bay Fire (1868) and the Columbus Day Storm (1962)—influenced the distribution, composition, and structure of vegetation across the forest. Small-scale disturbances caused by subsequent small fires, windstorms, disease, insects, and harvesting also significantly affect the characteristics of the forest across the landscape.

Biological Elements

Vegetation

The Coos District is located within the Oregon Coast Range Ecoregion. The precipitation levels and geology of the Coast Range render it unique among its neighbors, the Klamath Mountain and Willamette Valley ecoregions. These unique qualities result in an unusual

combination of plants within the forest ecosystem. These plants provide habitat and forage, add organic matter to forest soils, and influence the microclimate.

Conifer forest covers most of the land in the ESF. Before these lands became state forests, large fires killed or removed most of the older conifer forests. Approximately 90 percent of the forest is covered in conifer stands. The vegetation types in the remaining areas include various species of hardwood trees such as alder and bigleaf maple, and grass and brush. About half of these stands are more than 85 years old with the remainder being between 0 and 50 years old.

Insects and Disease

Most insect damage on the Oregon Coast is caused by the Douglas-fir bark beetle (*Dendroctonus pseudotsugae*), which tends to affect low vigor trees weakened by other factors. Beetle population buildup after significant disturbance events can cause damage to healthy trees. Increases in beetle populations tend to be short lived unless continued disturbance provides new habitat.

Laminated root rot (*Phellinus weirii*), is the most common and damaging disease in this area. This fungus is an efficient parasite that kills host trees of all ages and sizes. It is a relatively slow moving disease that can persist for up to 50 years in stumps of cut trees and roots of dead trees. Because Douglas-fir is particularly susceptible to this disease, fire suppression and domination by Douglas-fir in planted or natural stands have contributed to its spread.

Douglas-fir along much of the Oregon Coast is experiencing severe damage from Swiss needle cast; however it is not severe around the ESF. Though Swiss needle cast does affect some stands in the ESF, it has not become severe enough to cause serious decline in tree growth or require significant changes to silvicultural practices.

Fish and Wildlife

The ESF provides habitats for most native species found in forests in the Oregon Coast Range (Johnson and O'Neil 2001). Appendix E [of the FMP] contains lists of native fish and wildlife species, with scientific names, that are currently known, or are likely, to exist on or adjacent to the ESF. Songbird and stream amphibian surveys conducted in 2001 resulted in detection of many of the species listed in Appendix E. A total of 63 species of birds were detected during avian surveys, notably the band-tailed pigeon, purple martin, western bluebird, olive-sided flycatcher, and willow flycatcher which are all listed as Strategy Species in the Oregon Conservation Strategy. The band-tailed pigeon was widespread and relatively abundant throughout the Elliott State Forest. The olive-sided flycatcher and willow flycatcher were detected throughout the forest, but were not abundant. The western bluebird and purple martin were rare and restricted to a couple of basins. During the stream amphibian surveys, six species were detected: Southern torrent salamander, tailed frog, Pacific giant salamander, Dunn's salamander, western red-backed salamander, and rough-skinned newt. Of these species, the southern torrent salamander and tailed frog are listed as Strategy species in the Oregon Conservation Strategy. Both species were found in most of the 9 streams sampled, however abundance appeared to be relatively low.

Of the many fish and wildlife species found in the ESF, four species are listed as threatened or endangered under either the federal or state Endangered Species Act (ESA) (or both) [bald eagle, marbled murrelet, northern spotted owl and coastal coho salmon,].

Bald eagles are found on or near the ESF year-round, and use the state forests and waters for nesting, foraging, and roosting. Because a pair of eagles often uses alternate nest sites, each nesting territory can include multiple nesting sites. In 2010, there were four occupied bald eagle nesting territories with nest sites on the ESF.

The marbled murrelet was listed as threatened in 1992 by the U.S. Fish and Wildlife Service (USFWS) within Washington, Oregon, and California. Surveys for marbled murrelets have been conducted in the ESF since 1992. In addition, research on the habitat characteristics of marbled murrelet nesting habitat on state forest lands, including the ESF, was conducted between 1993 and 1998 (Hamer and Meekins 1996; Nelson and Wilson 2002). Through surveys and research, 11 nests were located and subcanopy behaviors were observed in many survey areas in the ESF. To date, surveys have resulted in the establishment of 57 MMMAs with an average size of 209 acres.

Surveys of potential marbled murrelet habitat in and around proposed harvest operation occur every year in accordance with State Forests Operational Policy for Marbled Murrelets and typically result in the designation of additional marbled murrelet management areas. This trend is anticipated to continue for the foreseeable future.

The northern spotted owl was listed as threatened by the USFWS in 1990. Surveys for spotted owls occurred in the ESF and adjacent suitable habitat between 1990 and 1993. In addition, research on the demographics, habitat use, and habitat characteristics of spotted owls on state forest lands, including the ESF, took place between 1993 and 1998 (Anthony et al. 2000a, 2000b; Tappeiner et al. 2000). Although there was an apparent loss of territories over the five years of the study, the rate of population change remained relatively steady, largely because of greater survival and fecundity. A density survey of all suitable spotted owl habitat in the ESF in 2003 located an equivalent number of owl sites as the last similar survey in 1996. Density surveys in 2010 and 2011 found slightly more owls and activity centers than in 2003 surveys. After 2011, owl surveys will continue in and around proposed harvest operations in accordance with State Forests Operational Policy for Northern Spotted Owls. Density surveys may be done periodically as needed in the future.

Coho salmon were listed as threatened in 2008 by the National Marine Fisheries Service in the Oregon Coast Evolutionarily Significant Unit (ESU). Coho are found in all three major drainage basins in the ESF, the Umpqua, Coos and Tenmile Lakes.

The streams, rivers, lakes, and other water bodies in the ESF provide habitats for a variety of fish species. At least 30 species of fish use habitats in the plan area for part or all of their life history, or use habitats downstream from the state forest that may be influenced by state forest management.

Native salmonid species in the ESF include fall Chinook salmon, coho salmon, chum salmon (*Oncorhynchus keta*), winter steelhead, resident populations of rainbow trout (*Oncorhynchus mykiss*), and both anadromous and resident races of cutthroat trout (*Oncorhynchus clarkii*).

Native non-salmonid fishes include various species of lamprey, sculpin, dace, sucker, and others.

Anadromous salmonid populations have been generally depressed throughout western Oregon for a variety of reasons, including reduced survival in the ocean, reduced productivity of freshwater habitats due to logging, farming, and conversion of farm and forestland to other uses such as for dwellings and industrial use, and fishing levels. In recent years, numbers in the ESF have improved. For resident salmonid populations, resident cutthroat trout are widely distributed and appear stable, although special consideration is warranted for populations isolated above natural barriers. There is much less information about the status of non-salmonid species. Two species, the Pacific lamprey and *Millicoma longnose* dace, are of concern due to limited distribution, reduced abundance, and/or special habitat needs.

During the IP period, management plans and overarching planning documents of other agencies will be considered when managing for fish and wildlife (e.g., Oregon Coast Coho Conservation Plan, Oregon Conservation Strategy, ESA recovery plans).

Carbon

Older forests, especially in the Pacific Northwest, store large amounts of carbon in live and dead trees, as well as the forest floor. Recent analyses of older forests illustrate that carbon storage in many unmanaged landscapes is not at equilibrium, but rather is increasing (Luyssaert et al., 2008). A recent study in the Pacific Northwest has shown that the potential to store additional carbon in regional forests is among the highest in the world because much of the area has forests that are long-lived and maintain relatively high productivity and biomass for decades to centuries (Hudiburg et al., 2009).

Carbon sequestration and associated carbon offset credits from forest environments can be enhanced by increasing the net uptake of carbon into forests, decreasing carbon releases from forests, or preventing carbon emissions caused by the conversion of forests to other land uses. Broadly speaking, there are three general categories of forest management that are considered to improve carbon sequestration: afforestation/reforestation, avoided deforestation, and improved forest management. The ESF management plan and Oregon's Forest Practices Act emphasize these three approaches to management and, therefore endeavor to maximize carbon uptake and storage.

A recent study of carbon storage on the ESF, conducted by Ecotrust, estimated the current (2010) carbon inventory to be about 24,500,450 metric tonnes of CO₂-equivalent (tCO₂e) (Davies, B. et al., 2011). According to the study, if no harvests were to occur on the ESF, the total amount of carbon stored would be approximately 46.6 million metric tonnes of CO₂e by 2050. Harvest levels in the range of 35-40 mmbf would store approximately 60 percent of the maximum carbon storage possible in the forest by 2050, while also capturing some carbon in long-lived forest products. Implementing the strategies of the FMP will result in increasing carbon levels over time.

Currently, there are no legal requirements that direct the State Land Board to manage for carbon in addition to the other legal mandates. However, ODF recognizes the increasing

importance of greenhouse gases, including carbon dioxide, and their potential effects on climate and the environment. As responsible stewards of Oregon's forests, we will pay attention to greenhouse gas-related effects of our operations to the best of our ability. However, we currently do not have the resources to conduct detailed analyses of all of our operations.

Human Uses

Forest Management

Under the 2011 FMP reflected in this Ten-Year Implementation Plan, ODF anticipates that annual clearcut harvesting will average about 850 acres and commercial thinning will average about 250 acres per year. Commercial thinning will be planned as stand conditions and market conditions allow. The average annual volume over the first ten years is expected to be about 40 MMBF. The District will achieve this volume by implementing the strategies of sustainable Forest Ecosystem Management as defined in the FMP. For context, a study conducted by Mason, Bruce and Girard estimates that the biological potential³ of the forest could reach a sustained growth of 75 million-board-feet per year if the forest were managed purely for volume growth with no constraints on management (e.g., no FPA rules, ESA protections, or other protection measures).

Roads on State Forestlands

The ODF's policy on forest roads states that roads will be developed and maintained to provide access for the sale of timber and other forest products, timber management activities, and protection from fire. It also states that forest roads will be designed, constructed, and maintained to meet or exceed rules of the Forest Practices Act (FPA). These rules set construction and maintenance standards intended to protect water quality, forest productivity, and fish and wildlife habitat. In addition to establishing the policy, the ODF's *Forest Roads Manual* sets road standards, gives design guidelines, sets an excavation and appraisal policy, and provides a wide variety of specifications and costs (Oregon Department of Forestry 2006).

The road system for ESF consists of approximately 550 miles of road and is essentially complete. However, additional spurs will still be needed to access future timber sale units; usually less than a quarter mile of new construction per timber sale. Roads are built or improved as projects on timber sales. They are designed and constructed to standards that provide for good road maintenance and safe log transportation. Mainline and collector roads are surfaced with rock to provide for all-weather use and to minimize effects from rainfall

³ This estimate biologic potential is a theoretical maximum unlikely to be achieved in the real world that is based on a number of assumptions including: the entire forest has been converted to plantations that receive optimal management; plantations are evenly distributed across age classes; all acres are capable of the growing and harvesting of trees (except for existing roads and the channel and 25 foot buffer of fish bearing and perennial streams); there are not northern spotted owl, marbled murrelet, high landslide hazard locations, or other resource sites to interfere with harvesting.

and runoff. Spur roads are built to the same maintenance standards, but may have lesser specifications for width and surfacing. In many instances, spurs are blocked off after a timber sale or other forest management activity is completed, to minimize disturbance for elk and deer and for other management reasons. These roads are still subject to road maintenance requirements, unless they are legally closed or decommissioned by removing culverts and providing necessary long-term drainage.

A significant portion of state forestland is accessed by roads that extend through privately owned forest land. Legal easements are necessary to use these roads for the hauling of logs from timber sales or for other forest management activities. The ODF has acquired easements for many roads, and in some cases requires further acquisition of easements. Depending on the district's needs and the private owner's desires, easements can be temporary or permanent, and allow either public use or use only by the agency's employees and contractors.

The ESF roads and private roads with easements are maintained under a road maintenance contract or by contractors as a requirement of a timber sale contract. District personnel monitor road use, determine maintenance needs, and develop maintenance plans. These plans include road surface maintenance (grading and rock application); ditch, waterbar, and culvert maintenance; roadside vegetation control; storm monitoring; and damage repair.

Recreation

Recreation use within the ESF is informal and concentrated in several small areas of the forest; the remainder of the forest has little recreation use. The heaviest use occurs on long holiday weekends in the summer, and during deer and elk hunting seasons in the fall. Most forest visitors are local residents who enjoy the undeveloped and relatively unregulated nature of recreation in the forest, with little competition for favorite sites. Future demand is expected to be consistent with the recreation activities currently popular in the ESF with little increase in use.

The ESF provides numerous areas for dispersed camping along roads and streams. Popular areas include Elk Creek and the West Fork Millicoma River. Other sites are scattered throughout the forest, with widely varying use levels. The Bureau of Land Management (BLM) operates and maintains the Loon Lake Recreation Area adjacent to the northeast corner of the ESF. Loon Lake is one of the more popular destination sites in the Reedsport vicinity, with an average of 70,000 to 80,000 visitors each year.

Some visitors to the ESF use old skid roads and trails for preseason scouting and hunting. Most people use existing roads, many of which have been blocked off to regular vehicle activity, use of all-terrain vehicles is allowed on these roads.

Horse riding, hiking, picnicking, and mountain biking activities occur across the forest, but in lower to moderate levels. Hiking and mountain biking trails have not been developed, as use is fairly infrequent.

Winter steelhead fishing is popular in the ESF in the West Fork Millicoma River. The Oregon Department of Fish and Wildlife (ODFW), through its Salmon Trout Enhancement

Program, created an increase in steelhead fishing opportunities at the Millicoma Interpretive Center and below.

Most recreational hunting in the ESF occurs during the big game hunting season, which begins in late August and continues through January.

A small number of people use the forest for other specialized activities. Kayakers use the West Fork Millicoma River, and sightseers use the ESF's backcountry roads. Trappers are active year round. Geo-caching is increasing in popularity. School groups, universities, and forestry organizations also use the forest for various educational tours.

Scenic Resources

State Highway 38, adjacent to ESF lands, is designated by the FPA as scenic for the purpose of visual corridor management. The visually sensitive corridor is defined in two zones, the first zone is the area within 150 feet of the outermost right-of-way boundary along both sides of the highway. The second zone is outside the first area from 150 feet to 300 feet. Special rules apply to timber harvest in this corridor.

On private lands between the river and the ESF, the lower Umpqua River along Highway 38 and its immediate visual foreground is protected either by Department of Transportation-owned scenic buffers or by scenic statutes and FPA rules.

3. Conservation Area Management and Landscape Condition

Current Condition Analysis

The current stand condition is displayed in Figures 1 and 2, and in the third map in the **Map Section**. Conservation areas are displayed in the second map in the **Map Section**.

Figure 1. 2011 Stand Structure by Acres and Percent

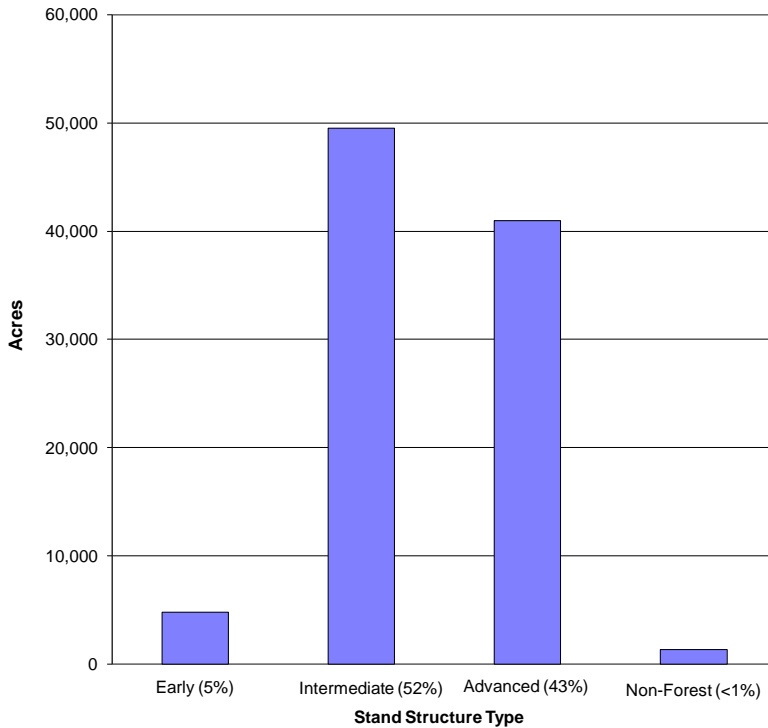


Figure 1 shows the current stand structure, acreage, and percentage. The definitions of these stand structures can be found in the FMP on page 5-9. The current stand structures on the ESF were determined by interpretation of aerial photographs coupled with information from the OSCUR forest inventory database and the newer Stand Level Inventory (SLI). The SLI database contains the most precise and up-to-date stand structure information (e.g., understory species composition, nonmerchantable tree species, layering). Stands in the Advanced Structure were initiated as a result of the Coos Bay Fire of 1868 or are the survivors of that fire. The Early and Intermediate Structures were initiated after management activities and disturbances (i.e. the Columbus Day Storm) that have occurred since the establishment of ESF.

Figure 2. 2011 Stand Age Distribution, by Acres and Percent

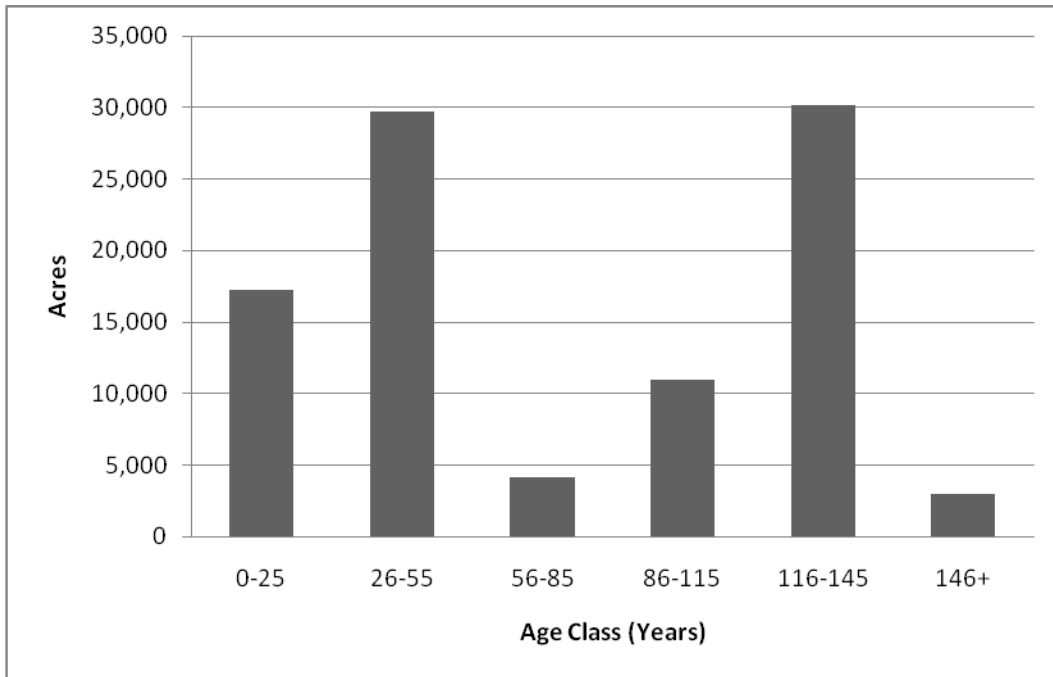


Table 4. Summary of Conifer Age Classes

	Age Class (Years)						Total
	0-25	26-55	56-85	86-115	116-145	146+	
Acres	17,276	29,680	4,187	10,985	30,125	3,020	95,273

Figure 2 shows the 2010 age distribution of the ESF, regardless of structure, by acreage and percentage. Table 4 gives an acre summary of the conifer age classes. Stands in the 146+ age class are survivors of the Coos Bay fire. Stands in the 116-145 age class were established as a result of the Coos Bay Fire. Stands in the 86-115 age class resulted from harvesting or disturbances prior to the establishment of the ESF. Stands in the 0-85 age class were established after the formation of the ESF. About 6,000 acres in the 26-55 age class were established as a result of the Columbus Day Storm. Approximately 6,500 acres in the 0-25 age class were established under the HCP.

Stand Structures Interaction

The Current Condition Analysis and the sections of this IP describe the amount of each of the identified forest stand types, which are Early, Intermediate and Advance Stand Structures. As described in the FMP, the stand types represent only three points along a continuum of forest development. Three “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 three types are only points along a continuum, they do not express three specific habitat types, nor are they perceived as discrete habitats by wildlife species. Appendix C of the FMP discusses these concepts in more detail.

Stand structure is described in three fundamental stand types: early structure, intermediate structure, and advanced structure. These stand types roughly correspond to young, pole-sized, and mature forest age/size classes.

Thus, as the current and expected future conditions described by the stand types are examined, it is important to consider the combinations and aggregations of different stand types that function together are expected to provide a range of habitat conditions. The range of stand types, along with FMP strategies to provide conservation areas, legacy structures (old-growth trees, retained live trees, snags, and logs), riparian management areas, and steep, unique, and visual areas is expected to contribute to biodiversity across the landscape. The entire array of stand types has not been depicted because it is virtually impossible to predict how each stand on the landscape will develop over the next several decades.

Hardwoods

When forest management activities started on the ESF in the 1950s, the forest predominantly consisted of Douglas-fir, with a minor component of other conifers (mainly hemlock and very small amounts of red cedar and Sitka spruce). With most ESF timber sales, the volume of these other conifers usually has accounted for less than 5 percent. When forest management began, hardwoods accounted for somewhat less than 10 percent of the acreage, with much of this in riparian areas. Most of the riparian hardwoods are red alder, with lesser amounts of big leaf maple and myrtle. A higher amount of red alder is located in the Marlow Creek drainage, which was railroad logged in the 1920s to 1930s. Significant amounts of myrtle exist on south slopes in the western half of the forest. Other native hardwoods include very small amounts of bitter cherry, cascara, madrone, chinquapin, and dogwood.

Under the FMP, a significant hardwood component will be located in riparian areas and conservation areas and in other areas of the forest designated as Advanced Structure. In addition, hardwoods will be retained as an important component of green tree retention, with a particular emphasis on the less abundant myrtle and big leaf maple which are especially important to wildlife. In addition, a certain amount of red alder that exists in current plantations and that will seed into new regeneration harvests will be retained in these stands. Overall, the strategy for hardwoods calls for retaining approximately the same amount and species composition as existed in the forest when the FMP was first implemented. Hardwood stands are defined as having a canopy of at least 70 percent hardwoods.

Early Structure

Early Structure covers 4,764 acres (5 percent) of the district (see figure 1), which is below the expected outcome for Early Structure of 10 to 20 percent. This structure is currently characterized by young, even-aged Douglas-fir plantations resulting from clearcut harvests

occurring over the past 15-20 years. These stands will be actively managed to achieve a sustainable harvest level.

Intermediate Structure

Intermediate Structure accounts for 49,542 acres (52 percent of the district), which is within the expected outcome target for Intermediate Structure of 30 to 60 percent. This structure is characterized by the closed crowns of the overstory trees which prevent light from reaching the majority of the forest floor. This low light level precludes the natural regeneration of both brush and shade tolerant tree species, thus leaving the forest floor sparsely vegetated. Overstocking results in competition for light, water, and nutrients, often leaving the stand susceptible to insects, disease, wind, or fire. Of all the structure types, Intermediate Structure is least used by wildlife species, especially those requiring more complex habitats.

In the ESF, this stand type is typically in the 20 – 65 year-old age class. Most conifer stands in this stand type are the result of planted and managed stands. This type also encompasses mature forest types that do not have the structural components of Advanced Structure. Hardwood stands in this stand type, on the other hand, are naturally regenerated. A portion of stands in this class are mixtures of managed stands with areas of low stocking that naturally regenerated in alder. These stands will be actively managed to achieve a sustainable harvest level.

Advanced Structure

The Advanced Structure currently covers 43 percent of the district (40,967) acres, which is within the expected outcome for Advanced Structure is 30 to 50 percent. The Advanced Structure stand type is the result of continued growth and development of the Intermediate Structure stand type, and is therefore more complex in vertical canopy arrangement. In addition, the vertical layering offers a diverse array of habitat niches for more complex shrub and herb communities as well as wildlife species. Most of the Advanced Structure is the result of the 1868 Coos Bay fire, and is 130 to 140 years old. A portion of the Advanced Structure, mostly located in the Marlow Creek drainage, is in the 65-year age class, and developed after early logging in the 1920s and 1930s. A small portion of the Advanced Structure is considered old growth (454 acres), and has been designated as conservation areas. For this IP, Advanced Structure stands have at least 20 trees per acre of 18 inches or larger DBH (diameter breast height) and 100 feet or more in height. At least ten of those are at least 24 inches DBH. Understory trees average 30 feet in height, stands will typically have a snag and down wood component.

Non-Silviculturally Capable

Non-silviculturally capable (NSC) lands do not constitute a significant acreage; approximately 571 acres are in this classification. These 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 commercial tree species (e.g., serpentine soils). Hydrologic conditions include floodplains, marshes, beaver ponds, and

other aquatic conditions that prevent the growth of trees. These lands provide for plant and animal communities not associated with the other forest structures. These lands are not considered part of the commercial forest land base, and will not be managed for the growth and harvest of forest tree species.

Conservation Area Management

Table 8, located in Section 5, summarizes the current acres in conservation areas: MMMA's comprise 11,743 acres, and will be managed in accordance with State Forest Division take avoidance policies. Limited management is anticipated within MMMA's, an exception would be if the MMMA became historic. Additional MMMA's will most likely be added as new MMMA sites are identified. Owl circles currently comprise 67,849 acres. Management in owl circles will occur when NSO circles have sufficient habitat. The location and number of NSO circles will most likely change as a result of surveys. The continued updating of conservation areas across the landscape and the resulting adjustment of harvest units and sale plans is an inherent part of the Take Avoidance strategy.

4. Management Activities

Annual Operation Planning

The individual Annual Operations Plans (AOPs) describe how the activities and projects planned on the Coos District will achieve the goals and objectives of the FMP and IP. The planning for each AOP starts several years in advance with the selection of proposed harvest units and the determination of survey needs. The final location and distribution of management activities will be dependent on the annual results of T&E surveys and the application of T&E policies.

Management Activities in Each Stand Type

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

Early Structure

Management practices for Early Structure stands will be applied in order to obtain the greatest value of this structure (rapid tree growth, big-game forage, wildlife habitat, etc.). All stands will be actively managed to achieve a sustainable harvest level.

Reforestation

Reforestation promptly follows all clearcut harvests and patch cuts, depending on the stand objective. Spacing, species, and stock types depend on the site-specific conditions and availability. Site preparation (clearing of planting spots), vegetation management (control of

brush and grass), and tree protection activities will be undertaken in conjunction with stand establishment and maintenance. Site-specific prescriptions may include herbicide treatments, manual release, slash burning, or mechanical site preparation.

Precommercial Thinning

Precommercial thinning (PCT) is a density management practice that removes some closely spaced trees, including small and defective young trees or competing vegetation, to provide more water, light, and nutrients for the healthy residual trees. Stands scheduled for early clearcutting may not receive a PCT.

Fertilization

Broadcast fertilization may be beneficial in portions of the district, where the site would show the greatest benefit in growth increase. As time and resources are available, a rate of return analysis will be conducted for this stand management opportunity.

Intermediate Structure

Partial Cut

Past management experience has shown that most Intermediate Structure stands respond very well to partial cutting. Not only do the residual trees grow faster, but complex structures and diverse habitats develop more rapidly with the creation of snags, down wood, and a shade-tolerant conifer understory. The effects of partial cutting improve forest health through increased stand vigor, and lower susceptibility to damage from insects, disease, fire, and windthrow. This management option also produces timber, revenue, and enhancements to other resources such as scenic and wildlife resources.

Snag creation within the younger Intermediate Structure stands is not planned. It is anticipated that approximately two snags per acre will develop as a result of logging operations, windthrow, and natural mortality. Existing cull logs and large down wood will be left on site. It is anticipated that the target for large down wood will not be reached until later commercial entries. Achieving the downed wood component often requires a significant amount of time (many decades), especially in areas where existing stands are deficient in this material.

Fertilization

Broadcast fertilization may be beneficial in portions of the district, where the site would show the greatest benefit in growth increase. As time and resources are available, a rate of return analysis will be conducted for this stand management opportunity.

Clearcut

Clearcut harvest will be applied to achieve a sustainable harvest level. This management will result in the expected ranges of stand structures. 2-4 live trees per acre will be retained to provided for future snag and downed wood contributions.

Advanced Structure

Partial Cut

Little partial cutting is anticipated in Advanced Structure. Partial cutting would not occur in MMMA's, Public Safety, habitat deficient owl circles or inner RMA's. High density stands not planned for harvest in the near term are likely partial cut candidates.

Clearcut

Clearcut harvest will be applied to achieve a sustainable harvest level. This management will result in the expected ranges of stand structures. The clearcut harvest will incorporate the retention of key legacy structural components including live tree retention, snag and downed wood as addressed in the FMP.

Proposed Management Activities

Table 5 summarizes proposed management activities starting January 1, 2012. These activities are not all inclusive, and may change based on district priorities and budget levels. The acreages refer to the annual activities planned through the Annual Operations Plan (AOP) process.

Silvicultural Activities

Partial cutting and clearcutting will take place in Intermediate and Advanced Structure. Modeling indicates that the harvest levels shown in Table 5 are sustainable at an average of 40 MMBF per year with a range of 35 MMBF – 45 MMBF per year.

Table 5. Estimated Annual Silvicultural Activities Starting in January 1, 2012

Activity	Estimated Annual Acreages
Partial cut	0-500 acres ²
Clearcut	700-1000 acres ³
Reforestation	
- Initial Planting	700-1000 acres
- Interplanting	0-50 acres
- Underplanting	0-5 acres
Precommercial Thinning	400-700 acres ¹
Fertilization	0-1000 acres ¹

1. The acres shown represent a range dependent on annual workloads and budget levels.
2. Partial cutting will be done as necessary to meet silvicultural objectives.
3. The average annual clearcut harvest is estimated at 850 acres. Harvest acreage and volume will fluctuate depending on the volume per acre of stands being harvested.

Specific silvicultural actions are identified and scheduled in AOPs. As outlined in the FMP, geotechnical specialists will provide the initial slope stability hazard and risk assessment for

commercial forest operations in the AOP. This assessment will allow for proper consideration of alternatives to achieve the best decision for the resource and avoid, minimize, or mitigate identified risks.

Roads

The desired condition of the road system is one that provides access for forest management and fire protection, while minimizing the overall density of roads on the landscape and the potential impacts to other resources. During the planning period, four types of road activities will be accomplished:

- **Construction**—New roads will be constructed to provide access to future timber sales.
- **Improvement**—Existing roads will be upgraded to meet current and future needs, correct unsatisfactory conditions, meet desired road standards, and prevent environmental damage.
- **Maintenance**—Road maintenance will be performed as necessary to minimize adverse environmental impacts, ensure continued forest access, and protect investments.
- **Vacating**—Roads that are temporary or that are determined to not be a component of the permanent transportation system will be vacated (or closed).

All of these activities will be conducted in compliance with the FPA. Guidance for achieving the desired condition will come from the *Forest Roads Manual* (Oregon Department of Forestry 2006) The majority of Level I (broad level, long range) and Level II (mid level, moderate range) transportation planning required by the *Forest Roads Manual* has already taken place across the district during the development of the district’s current forest road network. Level III (detailed level, short range) transportation planning will be conducted in conjunction with the development of AOPs and timber sale design. As road activities are planned, the following issues will be considered:

- **Location**—New roads will be located to the greatest extent possible on ridge tops or near the ridge tops where slopes are relatively gentle. ODF’s Southern Oregon Area geotechnical specialist will be consulted on proposed roads through the Annual Operations Plan process. Roads will be designed to the minimum width necessary to accommodate the planned road use.
- **Surfacing**—Mainline and collector roads will be surfaced with hard rock to a depth sufficient to allow all-weather use. Spur roads may also be surfaced with hard rock where road use is permanent and surfacing is necessary to support planned management activities. Some temporary roads may not be surfaced and used only during dry weather, and then closed upon completion of use. A “winter–wet weather option” may be included in timber sales. This option precludes unnecessary rocking expense for units logged in the dry season, but allows a way for purchasers to log

during the wet season if they choose to pay for constructing the necessary drainage system and for the additional rock required. Purchasers of ESF clearcut sales frequently use this option.

- **Drainage**—Drainage structures will be installed as necessary to provide proper drainage and minimize delivery of sediment to streams. New stream-crossing structures will be designed to pass a peak flow that at least corresponds to the 50-year return interval. New stream-crossing structures in Type F (fish-bearing) streams will be designed to allow the migration of juvenile and adult fish during conditions when fish movement in the stream normally occurs. New and replacement stream-crossing structures will be consistent with Oregon fish passage laws.
- **Excess sidecast**—Roads will be assessed to identify existing sites that present a significant risk of sidecast failure with a significant risk of resource damage. These sites will be reconstructed to minimize the risk.
- **Road maintenance**—Purchasers of timber sales will be responsible for maintenance on active roads within the timber sale areas. Maintenance on all other district roads will be performed by a road maintenance contractor. Landslides and washouts will be repaired if the road can be stabilized and additional resource damage minimized. If the road cannot be stabilized or resource damage continues to occur, consideration will be given to vacating the road and/or relocating access. Key elements of road maintenance include:
 - **Inventory**—A detailed road inventory will be initiated, completed, and updated on an ongoing basis to reflect any road improvements or changes to the road system. Major elements of the inventory include assessments of road drainage, surfacing, stability, and vegetation conditions. Information will be used to identify risks and prioritize road maintenance and road improvement needs.
 - **Identification**—Road signs are placed to identify roads and facilitate the use of the road system for personnel conducting forest management activities and emergency services. Signs will be maintained and replaced as necessary.
 - **Inspection**—Roads will be inspected on an annual basis or more frequently, depending on the level of road use or as specific conditions warrant.
 - **Planning**—Using information from the inventory and inspections, a maintenance operations plan will be developed, which will include the necessary maintenance activities.
 - **Storm patrols**—Within personnel safety parameters, roads will be monitored during significant storms. Post-storm patrols will inspect damage sites. Procedures include damage assessment, reporting, and repair estimates.

- **Wet Weather Hauling Restrictions** – During wet weather, haul routes will be designated along ridge top systems when possible to manage road sedimentation. When a ridge top road system is not available, haul routes will be monitored during periods of wet weather to determine whether the haul needs to be temporarily suspended to prevent sedimentation.
- **Managed Access**—Roads will be assessed to identify segments that could be blocked to restrict access; this will be done for the purposes of mitigating potential resource damage or reducing maintenance costs. Roads blocked to restrict access may be re-opened as access is required. Blocked roads will remain accessible to the public for non-motorized travel (hiking, biking, horse riding), with the exception of areas in active operations. Low-use roads may be vacated after use (culverts removed, waterbars installed, and blocked) if they are spur roads that access timber stands where no operations will occur for ten years or more. Abandoned roads will also be vacated if assessment determines that a resource risk exists and that the project is operationally feasible. Access coordination with ODFW will be implemented during the AOP to identify opportunities for cooperation and coordination. Road vacating will include:
 - Removing culverts and re-establishing original stream channels.
 - Pulling back old excessive side cast material.
 - Waterbarring subgrades and running surfaces.
 - Grass seeding running surfaces, cut and fill slopes.
 - Blocking access to vehicles.

Potential Road Activities

To accomplish the district’s silvicultural objectives, it is estimated that 20 to 40 miles of new road construction and 180 to 220 miles of road improvement will be necessary over the entire district during the planning period. Road construction and improvements identified in this IP will be primarily achieved through project work connected with timber sales. Additional details can be found in Section 4, “Management Basins.”

No new mainline roads will be required. Approximately 70 percent of the roads to be constructed will be spur roads as needed to provide access to timber sale areas. Collector roads make up the remaining 30 percent and, in most cases, will be used for numerous forest management activities over the next several decades.

Most of the newly constructed or improved unsurfaced roads providing access to the harvest units will be partially or fully vacated during the planning period. Between 20 and 50 miles of road will be vacated or closed during the planning period. Potential road activities are summarized in Table 6.

Partnerships regarding road improvement will be explored with adjacent landowners and local watersheds, specific actions will be identified and scheduled in the AOP. Road rights-of-way, easements and cost shares essential for management activities will be identified and scheduled in the AOP.

Table 6. Road Activities for the Coos District for the IP period

	Spur	Collector	Mainline
Current Miles of Road	277 miles	160 miles	113 miles
New Road Construction	10–30 miles	5-10 miles	0 miles
Road Improvement	50–70 miles	110–130 miles	20–30 miles
Road Closure and Vacation	20–40 miles	5–10 miles	0 miles
Estimated Miles of Road at End of IP Period	270–280 miles	170–185 miles	113 miles

Recreation

As described in the FMP, the ESF will continue to provide recreation opportunities that are consistent with the current recreational activities on the forest. This includes providing dispersed and undeveloped recreation opportunities such as hunting, fishing, trapping, camping, viewing, and other activities compatible with active forest management. Recreational use of the forest will be managed to minimize adverse impacts on other resources, such as water quality, as well as to accommodate a wide variety of existing uses while minimizing conflicts among user groups. The feasibility of making improvements to existing recreation sites will be determined on a site-by-site basis. Specific actions will be identified and scheduled in the AOP.

Public Safety and Law Enforcement

The district currently has a cost share agreement with the Coos County and Douglas County Sheriff departments, to provide patrol, enforcement, and investigation services on the ESF. The entire forest is patrolled by the Oregon State Game Officers during hunting season.

Aquatic Resources: Stream Enhancement Projects

Stream enhancement projects can be completed through two different methods; operationally when timber harvest operations are occurring along a suitable stream or through a strategic planning process whereby specific streams are targeted as part of a larger restoration effort. Stream habitat enhancement projects done in conjunction with proposed management activities will be considered on a site-specific basis as part of the annual operation plan process. Specific projects on identified streams will be finalized in a cooperative effort between district personnel and ODFW biologists. Projects will be completed during harvest operations where equipment and materials are available to conduct the work.

Larger stream enhancement project areas have been identified during a strategic planning process with district personnel, ODFW biologist and local watershed councils. Projects in these areas will be conducted as grant funding is acquired. Working collaboratively, ODF, ODFW and watershed councils will use the 2003 ESF Watershed Analysis, Oregon Conservation Strategy, and Coho Conservation Plan as a guide to design and implement specific projects and submit completion reports as appropriate.

Anticipated projects include placement of logs in streams to create pools and collect/retain spawning gravels, replacement of stream crossing structures (e.g., culverts) that block or impede fish passage, relocation or redesign of improperly located roads, stabilization of sediment sources (e.g., cut banks), road closure, and/or road vacation. The Elliott Watershed Implementation Plan will help prioritize enhancement activities. More discussion on restoration planning is provided in Appendix A.

A watershed analysis of the ESF was completed in 2003. In February 2005, a working group consisting of Salem ODF staff, ODF Coos District staff, Charleston ODFW staff, Coos Watershed Association staff, and Tenmile Basin Partnership staff met to plan the implementation of the ESF watershed analysis. Many of the recommendations have been implemented those that remain are incorporated in the Stream Restoration Strategy (Appendix A).

While not an exhaustive report of accomplishments, since 1995 ODF has invested \$2,224,686 in 239 stream and watershed enhancement projects. These projects have included improving fish passage, reducing road impacts to water quality, riparian planting, and instream structures to improve fish habitat. On the Elliott State Forests we have installed 46 wood placement projects to improve 35 miles of stream.

Cultural Resources

The cultural resource strategies in the FMP recognize that historic sites, relics, and structures are public resources and provide important clues to the historic use of state forest lands. Forest management activities such as timber harvest, road construction, and recreation site development can irreversibly destroy the integrity of historic sites.

Existing cultural resource databases have been incorporated into the district GIS to assist in the planning of long- and short-term management actions. This database will be used to help protect cultural sites and meet long-range plan goals. Review and refinement of this work will be required as new information becomes available.

A number of District personnel have attended the State Oregon Archaeology Training program, giving field personnel tools to identify potential cultural resource sites. The district will contact the State Historic Protection Office (SHPO) for guidance if areas of concern are encountered. Additionally, during this IP a procedure will be developed for integrating site protection into forest activity plans by providing practical guidelines for recognizing, assessing, recording, and protecting sites. New or known sites will likely be encountered by ODF field staff in carrying out management plans and activities. A system will be developed to provide guidance in recognizing, recording, and protecting sites in the short term, as well

as after the resource inventory has been completed. This system will identify procedures best carried out at the intermediate planning level (management basin) and at the annual planning level (activity area or site).

Energy and Mineral Resources

The Oregon Department of Transportation (ODOT) plans to develop its Charlotte Creek Quarry, which is located at the mouth of Charlotte Creek. This quarry is approximately 10 acres, and is situated adjacent to the ESF on all but the north side. Plans include a sale or exchange of 30 to 40 acres of ESF land adjacent to and south of the ODOT quarry due to access and development needs. ODOT owns forest land adjacent to the northeast corner of the ESF near Highway 38 that may be suitable in an exchange.

The ODF plans to explore the development of sandstone quarries within the ESF to provide base rock and rock for the running surface of low-volume ridge top spurs where the delivery of sediment to fish-bearing streams is not a concern.

Lands and Access

The ESF will develop a land acquisition and exchange plan that identifies potential consolidation and divestment opportunities. In carrying out this strategy, the district will review and update acquisition and exchange opportunities, establish priorities, and implement specific transactions by following procedures and reviews as outlined in State Land Board and BOF policies and rules, including the Department of State Lands Asset Management Plan which identifies specific scattered tracts managed by the Coos District that are to be evaluated for disposal.

The majority of Coos District's ownership boundaries have been surveyed and posted by district engineering personnel in past years. Nevertheless, a continuous need exists to conduct survey work in order to reestablish and maintain district property corners and boundaries. An inventory of property corners and lines has been in place for many years, and is updated periodically as required. The district's corner maintenance program provides a check on the integrity of property corners and their accessories. When deficiencies exist that affect the perpetuity of a property corner, restoration efforts are employed. Site visits to property corners also involves GPS (global positioning system) data collection. These data are used to upgrade GIS (geographic information system) land ownership overlays.

Land survey activities conducted on the Coos District are accomplished by district engineering personnel. The establishment, reestablishment, and maintenance of property corners and lines will be prioritized and scheduled through the AOP.

Scenic Resources

Areas have been identified that are sensitive to visual impacts from management activities. These are areas adjacent to or seen from major highway corridors designated as visually sensitive by the FPA, or areas with established, high public use vistas. Some visually sensitive areas, in which timber harvest would significantly impact visual quality, will be

managed so that the growing and harvesting of trees and other incompatible resource uses will be secondary to the visual values.

A full array of silvicultural treatments, harvest methods, and logging systems will be considered for use when operations are planned in these areas. These methods include various degrees, combinations, and shapes of regeneration harvesting, patch cuts, commercial thinnings, and partial cuts.

Plants

The ODF protects listed plant species in accordance with the state and federal ESAs. Known sites are mapped, and listed species that occur or are suspected to occur on state forests are identified; the lists are continually updated in consultation with the Oregon Department of Agriculture (ODA) Plant Division and the Oregon Biodiversity Information Center.

During plan implementation, the ODF will determine if listed species occur, or are likely to occur on lands where management activity is planned. If so, the district will determine if the proposed action is consistent with the conservation program for the listed species established by the ODA.

The three plant species likely present on the ESF are *Bensonia*, tall bugbane, and Howell's montia. *Bensonia* has been found above 2,500 feet at Signal Tree, above Camas Valley. Tall bugbane is found in lowland Douglas-fir forests with maple and sword fern. There are known populations on adjacent BLM lands. Howell's montia is found on moist lowland areas in vernal wet sites.

Elliott State Forest

These three species listed in Table 7 are on the State Candidate list. The remaining plants on the ODA plant list have a low likelihood of occurring on the ESF, although the ODA, Plant Division and the Oregon Biodiversity Information Center plant lists are reviewed periodically for updated information regarding changes in ranges, habitats and status.

The ODF is not aware of any other federally listed threatened or endangered plant species that are likely to occur on the main block of the ESF.

Table 7. Rare Plants in ESF Main Block

Scientific Name	Common Name	Status
Candidates for T&E Status, But Not Currently Proposed		
<i>Bensoniella oregona</i>	<i>Bensonia</i>	
<p>Found in wet meadows and moist streamside sites in Pre-Cretaceous meta-sedimentary rock at elevations above 2,500 feet. Known at Signal Tree above Camas Valley, the northern-most location with lowest elevation confirmed.</p>		
<i>Cimicifuga elata</i>	tall bugbane	

Found in lowland Douglas-fir forests with maple and sword ferns.

Montia howelia Howell's montia

Found in moist lowland areas, vernal wet sites, often on compacted soil less than 400 meters in elevation.

Scattered Tracts

The scattered tracts of the Coos District are spread across Coos, Douglas, and Curry counties. The serpentine geology of Southern Oregon has a tremendous influence on the botanical biodiversity of the area. Thus, the number of potential listed species is greater on the scattered tracts than on the main block of the ESF. There have been no comprehensive assessments or basic systematic surveys for rare plants on the scattered tracts. The following 29 plant species listed in Table 8, are on the state list of threatened, endangered, or candidate plants (Oregon Department of Agriculture, Plant Division 2010 and Oregon Biodiversity Information Center), and have the potential to occur on the scattered tracts.

Table 8. Rare Plants in ESF Scattered Tracts

T&E Listed		
Scientific Name	Common Name	Status
<i>Abronia umbellate</i> ssp. <i>Breviflora</i>	Pink sandverbena	Endangered
<i>Arabis macdonaldiana</i> ¹	Red Mt. rockcress	Endangered
<i>Aster vialis</i>	Wayside aster	Threatened
<i>Calochortus coxii</i>	Cox's mariposa-lily	Endangered
<i>Calochortus howellii</i>	Howell's mariposa-lily	Threatened
<i>Calochortus umpquaensis</i>	Umpqua mariposa-lily	Endangered
<i>Cordylanthus maritimus</i> spp. <i>palurtis</i>	Pt. Reyes bird's beak	Endangered
<i>Lilium occidentale</i>	Western lily	Endangered
<i>Lupinus sulphureus</i> ssp. <i>Kincaidii</i>	Kincaid's lupine	Threatened
<i>Microseris howellii</i>	Howell's microseris	Threatened
<i>Oenothera wolfii</i>	Wolf's evening-primrose	Threatened
<i>Phacelia argentea</i>	Silvery phacelia	Threatened
<i>Plagiobothrys hirtus</i>	Rough popcorn flower	Endangered

Table 8 continued. Rare Plants in ESF Scattered Tracts

Candidates for T&E Status, But Not Currently Proposed	
Scientific Name	Common Name
<i>Arabis koehleri</i> var. <i>koehleri</i>	Koehler's rockcress
<i>Bensoniella oregona</i>	Bensoniella
<i>Cimicifuga elata</i>	Tall bugbane
<i>Cypripedium fasciculatum</i>	Clustered lady's slipper
<i>Draba howellii</i>	Howell's whitlow-grass
<i>Frasera umpquaensis</i>	Umpqua swertia
<i>Gentiana setigera</i>	Waldo gentian
<i>Horkelia congesta</i> ssp. <i>congesta</i>	Shaggy horkelia
<i>Lasthenia macrantha</i> ssp. <i>prisca</i>	Large-flowered foldfields

Candidates for T&E Status, But Not Currently Proposed	
Scientific Name	Common Name
<i>Limnanthes gracilis</i> var. <i>gracilis</i>	Slender meadow-foam
<i>Meconella oregana</i>	White meconella
<i>Montia howellii</i>	Howell's montia
<i>Periderida erythrorhiza</i>	Red-root yampah
<i>Sidalcea malviflora</i> ssp. <i>patula</i>	Coast checker bloom
<i>Streptanthus howellii</i>	Howells streptanthus
<i>Trieleia hendersonii</i>	Leach's Brodiaea
<i>Viola primulifolia</i>	Western bog violet

Invasive Weed Management

The FMP calls 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.

The recent draft of the Policy and Procedures prepared for the State Forest Division describes how active Invasive Weed Management should be implemented. This section of the IP serves as the District Invasive Weed Management Plan that will be used to guide the management of invasive weeds on Oregon Department of Forestry managed lands. This plan is meant to be a dynamic document and it may be incomplete or lacking information; however, as new information becomes available it can be updated to reflect current best practices.

Invasive Species 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.

Table 9 lists common invasive species and their known occurrence on the district. Species may be added or removed over time and objectives for species may change as new information is acquired.

Table 9. Common Invasive Species and their Status on District

Species	Current Status	Objective
Garlic Mustard	None known	Prevent
False Brome	None known	Monitor
English Ivy	Isolated patches	Eradication
Gorse	Isolated - rare	Eradication
Himalayan Blackberry	All Basins & spreading	Control
Knotweed- various species	Isolated patches	Eradication
Scotch Broom	All basins	Control
Canada Thistle	Isolated patches	Prevent
Tansy ragwort	All basins	Monitor
Poison-hemlock	None known	Prevent
English Holly	None known	Prevent
Reed Canary Grass	Isolated patches	Monitor
St. Johnswort	None known	Prevent
Purple Loosetrife	None known	Prevent
Spartina Grass	None known	Prevent
Butterfly Bush	Isolated individuals	Eradication

Jubata Grass	Isolated individuals	Eradication
Meadow knapweed	Isolated individuals	Eradication

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

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

Special Forest Products

Special forest products include a variety of plant products, other than timber, that are collected or harvested for personal or commercial purposes. On the ESF, the following special forest products have been sold, or permits issued for their collection: sword fern, salal, huckleberry, Oregon grape, lichen and mushrooms. To date, these products have produced limited revenue, thus development and management has been minimal. The current ESF program for special forest products calls for responding to public inquiries and demands for these products.

Most firewood is generated from timber harvest activities, and is located in landing piles and cull decks. Approximately 500 free-use woodcutting permits are given to the public each year, allowing firewood to be cut for personal use. However, due to the current practice of leaving down wood across the harvest unit after logging, little wood is available for firewood use.

5. Management Basins

Basin Descriptions

The proposed management activities described below are for the planning period starting January 1, 2012. Activities already under contract, or in the fiscal year 2010 and first part of fiscal year 2011 AOP, may take place during the planning period, but will not be counted toward the planning period objectives. However these previously-planned activities will be consistent with this plan and all operational policies. Amounts of pre-commercial thinning, and fertilization depend on fiscal budget levels. Management basins are both numbered and given a place name. Conservation area acres include MMMA’s, Owl Circles, SUV’s, and

RMA's. The various conservation area acreages will change as additional surveys are conducted and new sites are discovered or other changes occur. Table 10 shows acres in each of the four types of conservation area and the current structure percentage by basin.

The district-wide total for Intermediate and Advanced Structure both fall within the ranges identified in the FMP, 30 – 60 and 30 – 50 percent respectively, while the Early Structure is currently below the range of 10 – 20 percent (see FMP Table 5-1 in Section 5). However, it is anticipated that the Early Structure will be near the bottom end of the range by the end of the 10 year planning horizon for this implementation plan

Each basin will have harvest opportunities including thinning and clearcut as well as associated road construction and improvement. The location and distribution of harvest units will be dependent on the results of yearly T&E surveys and will be described in the AOP's.

Table 10. ESF Management Basins, Conservation Area (CA) Acres and % Current Stand Structure.

Management Basin Name	Number	Acres	Conservation Areas				% CA	% Stand Structure ³		
			MMMA Acres	Riparian Acres	SUV Acres	Owl Acres ²		Early	Inter	Adv
Mill Creek	1	5,349	1259	584	1432	5298	99%	5%	54%	41%
Charlotte-Luder	2	6,322	1442	664	1525	6015	92%	0%	39%	61%
Dean Johanneson	3	7,271	197	837	310	5589	79%	0%	49%	51%
Scholfield Creek	4	4,974	380	693	57	4444	90%	0%	69%	31%
Big Creek	5	7,786	92	1035	71	6204	83%	1%	52%	47%
Benson-Roberts	6	7,381	910	875	20	6790	73%	0%	44%	56%
Johnson Creek	7	6,322	74	777	0	5103	80%	1%	48%	51%
Palouse Larson	8	6,509	660	831	454	2641	59%	6%	49%	45%
Henry Bend	9	8,256	1106	1070	1232	3445	56%	13%	54%	33%
Marlow-Glenn	10	6,512	1109	763	157	4699	79%	8%	68%	24%
Millicoma Elk	11	10,873	1843	1466	104	9441	90%	8%	46%	46%
Trout Deer	12	11,316	2312	1642	262	4132	46%	17%	51%	32%
Ash Valley	13	4,132	359	370	476	2571	67%	12%	46%	42%
Scattered Tracts	14	2270	0	203	247	1477	65%	1%	63%	36%
District Total		95,273	11,743	11,810	6,347	67,849	75%	5%	52%	43%

1. Conservation acreage estimates include overlapping designations, defined as areas where two or more conservation areas types occur on the same parcel of land. As a result, when the acres shown in Table 8 are totaled, this total can be greater than the number of acres in a basin. The % CA column is the total percent of each basin in conservation areas.

2. Owl Circle Acres represent total acres per basin in owl circles.

3. Less than 1% of the forest is in Non-silviculturally capable.

Basin 1—Mill Creek

This approximately 5,349-acre management basin is located in Coos and Douglas Counties in the northeastern corner of the forest in the Umpqua River watershed. Stands in this management basin are typical of the ESF, composed of a mix of structures from Early to Advanced.

The Mill Creek management basin has a number of unique land classifications. Mostly focused around the Mill Creek corridor, this basin contains land designated as Special-Operationally Limited (public safety), Special Visual, and Focused Visual. This basin has lands designated as public safety and Special-Visual near Highway 38. Focused-Visual lands are designated adjacent to the Loon Lake Recreation Area, which is managed by the BLM. The majority of these areas with unique land use classifications share coverage with MMMA's. In addition, Mill Creek management basin shares its eastern boundary with a variety of landowners, including the BLM, private industrial forestland, and other private landowners. Lastly, the Mill Creek management basin has two individual parcels (Sock Creek) located approximately one mile east of the main body of the ESF.

Conservation areas in this basin include two MMMA's, portions of owl circles, RMA's and SUVs. There are four active owl centers within this basin. One bald eagle pair has a primary and an alternate nest site along Mill Creek and the Umpqua River.

The major streams in the Mill Creek management basin are Mill Creek, Footlog Creek, Camp Creek, Double Barrel Creek, Puckett Creek, and Cold Creek. No domestic water sources are located in this basin, but a few do exist within close proximity to the ESF boundary.

The Umpqua watershed region provides prime habitat for coho salmon, steelhead, and resident and sea-run cutthroat trout. Portions of Footlog Creek in particular qualify as high-quality stream habitat. Mill Creek has a natural fish passage barrier located below the confluence with Cold Creek, in the south end of the basin below Loon Lake. No anadromous fish use is possible upstream of this gradient barrier.

Key Resource Considerations

- Northern Spotted Owl (Lower Mill pair site, Upper Mill pair site, Lower Camp Creek pair site, Footlog Creek pair status unknown).
- The basin includes the Lower Mill and Cold Mill MMMA's.
- Coho salmon and steelhead trout in Mill, Footlog and Camp Creeks.
- One Bald Eagle territory including the Footlog and West Scottsburg nest sites.
- Opportunities for in-stream habitat restoration (Footlog Creek).

Proposed Management Activities

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

Transportation – This basin is a medium priority for planning and/or investments in the infrastructure. Road construction will be mostly short spurs, road improvement will be at a greater rate than the last ten years.

Stream Enhancement Projects—According to the ESF watershed analysis, Footlog Creek has been identified as a candidate for future habitat restoration opportunities.

Recreation—Recreation in the Mill Creek management basin is typically centered on the Loon Lake Recreation Area, which is adjacent to the southern boundary of this basin. This area provides opportunities for camping, hiking, boating, swimming, and fishing. Additionally, dispersed camping sites exist along Douglas County Road #3, as well as up Sock Creek road. Hunting opportunities also exist within this basin. The basin will retain its qualities for dispersed recreation potential.

Basin 2—Charlotte Luder

This approximately 6,322-acre management basin is located in Douglas County in the northern part of the forest in the Umpqua watershed. Stands in this management basin are typical of the ESF, composed of a mix of age structures from Intermediate to Advanced. The Charlotte Luder management basin composes a large portion of the northern ESF Boundary. This boundary is adjacent to or near Highway 38, which has a buffer designated as Special-Visual, and Special–Operationally Limited, (public safety). These areas share some coverage with MMMA’s and owl circles.

Conservation areas in this basin include seven MMMA’s (five are within the basin and two are shared with an adjacent basin) portions of owl circles, SUV’s and RMA’s. There is one active owl center within this basin. One bald eagle pair has an alternate nest site in this basin along Indian Charlie Creek.

Major streams in the Charlotte Luder management basin are Indian Charlie Creek, Charlotte Creek, and Luder Creek. No known domestic water sources are located within this basin, but several are located just outside the forest boundary along Highway 38.

The Umpqua watershed region provides prime habitat for coho salmon, steelhead, and resident and sea-run cutthroat trout. Charlotte Creek is known to have a high density of juvenile coho salmon. Additionally, portions of Charlotte Creek and Luder Creek are considered to be high-quality streams and provide opportunities for in-stream habitat restoration.

Key Resource Considerations

- Northern spotted owls (Charlotte Creek and Luder Creek pair sites).
- Marbled murrelets: This basin includes the West Charlotte, Lower Charlotte, the majority of Charlotte Headwaters, Luder Umpqua, Luder Footlog, Footlog Ridge and a portion of Indian Charlie MMMA’s.
- Coho salmon and steelhead trout in Charlotte and Luder Creeks.
- Alternate Bald eagle nest site (Indian Charlie).
- Opportunities for in-stream habitat restoration (Charlotte and Luder Creeks).

- Charlotte Ridge Weather Station.

Proposed Management Activities

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

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

Stream Enhancement Projects—Both Charlotte and Luder Creeks have been identified in the ESF watershed analysis to possess future stream restoration opportunities.

Recreation—Recreation in this basin is mostly hunting and camping. The basin will retain its qualities for dispersed recreation potential.

Basin 3—Dean Johanneson

This approximately 7,271-acre management basin is within the Umpqua watershed and is located in Douglas County.

The Dean Johanneson management basin is located in the northwestern part of the forest. Forests in this management basin are typical of the ESF, composed of a mix of structures from Intermediate to Advanced, although the last clear cut harvest activities occurred in the early 1990s. A portion of this basin, 726 acres, is BOFLs. The remainder are CSFLs. This basin contains Special–Operationally Limited, (public safety). Twenty-six acres of pastureland along the lower end of Dean Creek is classified as Focused–Grazing. This area is under a cooperative agreement with ODFW and DSL to provide improved forage habitat for elk.

There are also two small areas of land classified as Special–Operationally Limited (public safety) on the northeastern end of this basin. The Dean Johanneson management basin shares a boundary on the north end with both private industrial forestland and the BLM.

Conservation areas in this basin include one MMMA and a portion of two others, portions of owl circles, SUV’s and RMA’s. There are two active owl sites within the basin. An old growth stand is classified as SUV in the northern portion of the basin.

The major streams in this basin are Hakki Creek, Dean Creek, and Johanneson Creek. No known domestic water sources are located within this basin. However, several exist just outside the forest boundary in the Dean Creek area. There are homesites within one-half mile of the forest boundary along Dean and Johanneson Creeks.

The Umpqua watershed region provides prime habitat for coho salmon, steelhead, and resident and sea-run cutthroat trout. In this basin, both Dean Creek and Johanneson Creek have been identified as possessing high-quality habitat in some areas.

Key Resource Considerations

- Northern spotted owls (Dean Creek and Johanneson Creek pair sites).
- Marbled murrelets: Middle Dean and a portion of Indian Charlie MMMA's
- Coho salmon and steelhead trout in Dean and Johanneson Creeks.
- Opportunities for in-stream habitat restoration (Dean and Johanneson Creeks).
- Old growth stand along Johanneson Creek.

Proposed Management Activities

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

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

Stream Enhancement Projects—Both Dean Creek and Johanneson Creek are candidates for future restoration opportunities, according to the Elliot State Forest watershed analysis

Recreation—Recreation in this basin is mostly hunting and camping. This basin will retain its qualities for dispersed recreation potential.

Basin 4—Scholfield Creek

This management basin is located in the Umpqua watershed, is approximately 4,974 acres and is located in Douglas County.

The Scholfield basin is in the northwestern portion of the forest. Forests in this management basin have been managed as long rotation basins since 1995. No recent clearcutting has taken place in this basin. The basin is composed of a mix of Intermediate and Advanced Structures, there is currently little Early Structure.

Conservation areas in this basin include five MMMA's, portions of owl circles, SUV's and RMA's. The major streams in this basin are Scholfield, Alder, Miller and Dry Creeks. These streams are fish-bearing (coho salmon, steelhead, and cutthroat trout) with all being important streams for coho production.

There are no domestic water sources located in this basin. There are four homesites within a half mile of the ESF along Scholfield Creek.

Key Resource Considerations

- Northern spotted owls (Wind Creek and Scholfield Creek pair sites).
- Marbled murrelets: North Scholfield, South Scholfield, Scholfield, Little Scholfield and Goody Ridge MMMA's.
- Coho salmon and steelhead trout. Scholfield, Alder, Miller and Dry Creek are streams that produce coho salmon and steelhead.
- Opportunities for in-stream habitat restoration (Scholfield, Alder, and Dry Creeks).

- Wind Ridge old-growth stand.
- Dean Mountain Fire Detection Camera

Proposed Management Activities

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

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

Stream Enhancement Projects—According to the watershed analysis, the lower portion of Schofield Creek, as well as Alder, Miller, and Dry Creeks, have moderate to low levels of existing large wood and would be good candidates for additional restoration projects.

Recreation—Recreation in this basin is mostly dispersed hunting and camping. The basin will retain its qualities for dispersed recreation potential.

Basin 5—Big Creek

This approximately 7,786-acre management basin is located in the Tenmile Lakes watershed in Coos and Douglas Counties.

Big Creek basin is in the western portion of the forest. No recent clearcutting has taken place in this basin. The basin is composed of a mix of Intermediate and Advanced Structures, with only one percent in Early Structure.

Conservation areas in this basin include a portion of one MMMA, portions of owl circles, RMA's and SUV's. There are three owl activity centers within the basin. According to the ESF watershed analysis, streams in the Tenmile watershed encircling the Big Creek watershed are important for coho salmon because of high-quality rearing habitat found within them and in downstream waters, particularly Tenmile Lakes. The major streams in the Big Creek basin are Murphy Creek, Big Creek, Alder Fork, Noble Creek, and Alder Gulch. All of these are fish-bearing and have populations of coho salmon, steelhead, and cutthroat trout. ODF&W has in-stream water rights on Murphy Creek, Big Creek and Noble Creek. A Private landowner has in-stream water rights on Alder Gulch. Big Creek and Alder Gulch have homesites within one-half mile of the forest boundary. There are no domestic water sources located in this basin.

About 32 acres of bottom land pasture in the Big Creek drainage, (just inside the west Elliott boundary) are in a Big Game Habitat Improvement Cooperative Agreement. The cooperators include ODFW, DSL, ODF, Tenmile Basin Partnership (TLBP), and a private party. Twenty five acres are set aside for a myrtle grove conservation area along Murphy Creek near the western basin boundary.

Key Resource Considerations

- Northern spotted owls (Alder Creek pair site, Murphy Creek pair site, and Noble Creek resident single site).
- Marbled murrelets: A portion of the Big Deer MMMA.
- Coho salmon and steelhead trout in Murphy, Big, Alder Gulch, Noble, and Alder Fork Creeks.
- Murphy Creek basin—Reference and monitoring basin for Tenmile Lakes Total Maximum Daily Load (TMDL) and Water Quality Management Plan.
- Myrtle grove classified as Special-Wildlife Habitat along Murphy Creek.
- Opportunities for in-stream restoration (Murphy, Big, Alder Gulch, Noble, and Alder Fork Creeks).

Proposed Management Activities

Harvest – Harvest opportunities in this basin are high. The majority of harvest opportunities during this planning period will be regeneration harvests.

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

Stream Enhancement Projects—According to the watershed analysis, Big Creek and Murphy Creek have moderate to low levels of existing large wood.

Recreation—Recreation in this basin is mostly dispersed hunting and camping. The basin will retain its qualities for dispersed recreation potential.

Basin 6—Benson Roberts

This approximately 7,381-acre basin is in Tenmile Lakes watershed in Coos County. The Benson–Roberts basin is in the western portion of the forest. No recent clearcutting has taken place in this basin. The basin is composed of a mix of Intermediate and Advanced Structures, with a small component of Early Structure.

Conservation areas in this basin include six MMMA's, portions of owl circles, RMA's and SUV's. There are two owl activity centers within the basin. One bald eagle pair has a primary nest site along Benson Creek near the western border of the forest.

The major streams in this basin, Benson and Roberts Creeks, have populations of coho salmon, steelhead, and cutthroat trout. Barn Gulch and Salmon Gulch are also good producers of coho salmon. There are two home sites within one-half mile of the ESF boundary along Benson Creek. No domestic water sources are located in this basin.

Key Resource Considerations

- Northern spotted owls (Roberts Creek pair site, Benson Creek pair site, and Upper Roberts Creek pair status unknown).

- Marbled murrelets: Roberts Ridge, Middle Robert, Little Bob, Roberts Headwaters, Dry Ridge and Benson Headwaters MMMA's.
- Benson Creek bald eagle nest site.
- Coho salmon and steelhead trout in Roberts and Benson Creeks.
- Opportunities for in-stream restoration (Roberts and Benson Creeks).

Proposed Management Activities

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

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

Stream Enhancement Projects— According to the watershed analysis, Benson and Roberts Creeks have moderate to low levels of existing large wood.

Recreation—Recreation in this basin is mostly dispersed hunting and camping. The basin will retain its qualities for dispersed recreation potential.

Basin 7—Johnson Creek

This approximately 6,322-acre management basin is located in the Tenmile watershed in Coos County.

The Johnson Creek basin is in the western portion of the forest. Forests in this management basin have been managed as long rotation basins since 1995. No recent clearcutting has taken place in this basin. The basin is composed of a mix of Intermediate and Advanced Structures; there is currently no Early Structure in this basin.

Conservation areas in this basin include one entire MMMA and the portion of another, portions of owl circles, SUV's and RMA's. There is one owl activity center within the basin. The major coho, steelhead, and cutthroat trout streams in this basin are Robertson Creek, Adams Creek, Hatchery Creek, Johnson Creek, and South Fork Johnson Creek. According to the ESF watershed analysis, streams in the Tenmile watershed, are important for coho salmon because of the high-quality rearing habitat found within them and in downstream waters. Streams in this basin contain very good spawning habitat for salmonids.

There are two homesites within one-half mile of the ESF, but no domestic water sources located in this basin.

Key Resource Considerations

- Northern spotted owls (Johnson Creek pair site).
- Marbled murrelets: Right Fork Johnson and a portion of Schumacher Headwaters MMMA's.
- Coho salmon and steelhead trout in Robertson, Hatchery, Adams, Johnson, and South Fork Johnson Creeks.

- Opportunities for in-stream habitat restoration (Robertson, Hatchery, Adams, Johnson, and South Fork Johnson Creeks).

Proposed Management Activities

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

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

Stream Enhancement Projects—According to the watershed analysis, Johnson Creek has moderate to low levels of existing large wood.

Recreation—Recreation in this basin consists mostly of dispersed hunting and camping. The basin will retain its qualities for dispersed recreation potential.

Basin 8—Palouse Larson

This approximately 6,509-acre management basin is located in the Coos watershed in Coos County, in the southwestern portion of the forest. Forests in this management basin are typical of the ESF, composed of a mix of age structures from Early to Advanced. About 422 acres are designated as a Special- Operationally Limited land classification due to public safety concerns. Eleven percent (1,085 acres) is BOFLs. This region of the forest is susceptible to Swiss needle cast.

Conservation areas in this basin include four MMMA's, portions of owl circles, SUV's and RMA's. The major streams in this basin are the Sullivan Creek, Larson Creek, and Palouse Creek, all of which contain populations of coho, steelhead, and cutthroat trout. Anadromous fish are unable to access the portion of Kentuck Creek within the ESF, due to a falls at the Kentuck quarry. No domestic water sources are located in this basin. There are several homesites within one-half mile of the ESF.

Key Resource Considerations

- Northern spotted owls (Palouse Creek pair site).
- Marbled murrelets: Palouse Larson, Larson Ridge, Larson Bottom, Sullivan Headwaters and Larson Point MMMA's.
- Coho salmon and steelhead trout in Sullivan, Larson, and Palouse Creeks.
- Opportunities for in-stream restoration (Sullivan, Larson, and Palouse Creeks).
- Long-term in-stream and riparian restoration projects on Palouse Creek.
- Swiss needle cast.

Proposed Management Activities

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

Transportation – This basin is a medium priority for planning and/or investments in the infrastructure. Road construction will be mostly short spurs, road improvement will be at a similar rate than the last ten years.

Stream Enhancement Projects—According to the watershed analysis, Larson and Sullivan Creeks have moderate to low levels of existing large wood.

Recreation—Recreation in this basin consists mostly of dispersed hunting and camping. The basin will retain its qualities for dispersed recreation potential.

Basin 9—Henry's Bend

This approximately 8,256 acre management basin is located in the Coos watershed in Coos County.

This basin is in the southwestern portion of the forest. Forests in this management basin are typical of the ESF, composed of a mix of age structures from Early to Advanced. Lands classified as Special-Operationally Limited due to Public safety concerns account for 390 acres. Eighteen percent (1,733 acres) are BOFLs. This region of the forest is susceptible to Swiss needle cast, and areas west of this basin are infected. There are two progeny sites at the lower end of the 2000 road that were established around 1970 to 1972 as part of a genetic improvement program. Their original purpose was to select favorable genetic traits and begin producing seedlings for operational out-planting in the forest. That purpose was fulfilled many years ago, and seed trees growing in the J.E. Schroeder Seed Orchard have these selected traits. This seed orchard produces all of the genetically improved seed needed for operational out-planting on the ESF.

Conservation areas in this basin include seven MMMA's, portions of owl circles, SUV's and RMA's. There is one owl activity center within this basin.

The major streams in this basin are the West Fork Millicoma River and the Totten, Daggett, Schumacher, and Eleven Creeks. These streams contain coho, steelhead, and cutthroat trout. There are two pump chances that have a water use permit. Trail Butte Reservoir and Schumacher Creek have water use permits and are used for forest management. Portions of the slopes above the West Fork Millicoma are designated in the Special-Visual land classification.

The Millicoma Interpretive Center is a fish hatchery and educational outreach facility on the West Fork Millicoma River operated by the ODFW. Salmonids, including chinook, steelhead, and coho salmon, are spawned, reared, and acclimated at this facility to support fishery programs.

ODF has a special use permit with Camp Millicoma, a non-profit group managing the site for day-use and overnight camping. This site is located immediately to the south of the Millicoma Interpretive Center.

This basin's main stream, the West Fork Millicoma, is a large stream critical to much of the anadromous fish species on the ESF. This waterway is important in providing habitat for good numbers of coho salmon.

Key Resource Considerations

- Northern spotted owl: Marlow Ridge Pair site
- Marbled murrelets: Kentuck Ridge, Daggett Headwaters, Lower Totten, Millicoma Schumacher, Schumacher Headwaters, Henrys Bend and Trout Mouth MMMA's.
- Coho salmon and steelhead trout in the West Fork Millicoma River and Totten, Daggett, Schumacher, and Eleven Creeks.
- Opportunities for in-stream habitat restoration (West Fork Millicoma River and Totten, Daggett, Schumacher, and Eleven Creeks).
- Millicoma Interpretive Center water sources for hatchery operations.

Proposed Management Activities

Harvest – Harvest opportunities in this basin are low. The majority of harvest opportunities during this planning period will be regeneration harvests.

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

Stream Enhancement Projects—According to the watershed analysis, Daggett Creek, Schumacher Creek, Totten Creek, and the West Fork of the Millicoma have moderate to low levels of existing large wood.

Recreation—Recreation in this basin consists mostly of dispersed hunting and camping. The basin will retain its qualities for dispersed recreation potential.

Basin 10—Marlow Glenn

This approximately 6,512-acre management basin is located in the Coos watershed in Coos County.

This basin is in the south to southeastern portions of the forest. Forests in this management basin are not typical of the ESF because the Marlow Creek portion was logged in the 1920s and 1930's. It is composed of a mix of age structures from Early to Advanced. This basin is unique with regard to its shape as it is split into three separate areas. Thirty-eight acres are in public safety reserves. This basin contains a considerable amount of BOFLs (36 percent, or 3,383 acres). The Heritage Grove is a surviving mature Douglas-fir and western hemlock stand from a 1770 fire and the 1868 Coos Bay Fire, and is designated as a Special- Plants land classification. This site is approximately 72 acres, and is located in the Silver Creek drainage in the southeastern corner of the forest.

Conservation areas in this basin include four MMMA's within the basin and three shared with adjoining basins, portions of owl circles, SUV's and RMA's. There are three owl sites within this basin.

The major anadromous streams in this basin are Marlow Creek, Y Creek, and Fourmile Creek. Silver Creek, Howell Creek, Cedar Creek, Glenn Creek, and West Fork Glenn Creek are above waterfall barriers at Golden and Silver Falls State Park, and only contain resident cutthroat trout. A small population of chum salmon exists in Marlow Creek immediately downstream of the forest boundary. No domestic water sources are located in this basin. There are numerous home sites within one-half mile of the south and east boundary of this basin.

Key Resource Considerations

- Northern spotted owls (Marlow Creek, Lockhart Road and West Glenn Creek pair sites).
- Marbled murrelets: Marlow Bottom, East Marlow, Marlow Lockhart, and West Glenn Creek. Portions of Beaver Headwaters, Elk Pass and Panther Headwaters MMMA's are within the basin.
- Coho salmon and steelhead trout in Marlow, Y, Piledriver, and Fourmile Creeks.
- Chum salmon in Marlow Creek.
- Resident cutthroat trout reside in streams above the falls barrier at Golden and Silver Falls State Park.
- Opportunities for in-stream habitat restoration (Marlow, Y, Piledriver, and Fourmile Creeks).
- Stream flow gauging station on Marlow Creek at the Elliott boundary (about the 1 mile marker).

Proposed Management Activities

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

Transportation – This basin is a medium priority for planning and/or investments in the infrastructure. Road construction will be mostly short spurs, road improvement will be at a similar rate than the last ten years.

Stream Enhancement Projects—The fact that much of this basin lies above the natural barrier of Golden and Silver falls will be taken into account when planning projects. According to the watershed analysis, lower Marlow Creek has moderate to low levels of existing large wood.

Recreation—Recreation in this basin consists mostly of dispersed hunting and camping. The basin will retain its qualities for dispersed recreation potential.

Basin 11—Millicoma Elk

This approximately 10,873-acre management basin is the second largest on the ESF, and is located mostly in Coos County, in the Coos watershed. A very small portion along the north and east edge of the basin is located in Douglas County. Forests in this management basin are typical of the ESF, composed of a mix of age structures from Early to Advanced.

Conservation areas in this basin include seven MMMA's, portions of owl circles, SUV's and RMA's. Three of the MMMA's are located entirely in the basin, and four are shared with adjoining basins. There are two owl centers within this basin.

This basin is situated in the upper reaches of the West Fork Millicoma River. The major streams in this basin are the West Fork Millicoma River and Fish, Panther, Kelly, Cougar, Elk, Hidden, Crane, and Skunk Creeks. No domestic water sources are located in this basin.

The streams in this basin are prime spawning and rearing habitat for coho, steelhead, and cutthroat. A fish ladder is located on Elk Creek and provides fish passage to a majority of the Elk Creek drainage basin.

Key Resource Considerations

- Northern spotted owls (Panther Creek resident single site, Cougar Creek pair site).
- Marbled murrelets: Elk Forks, Panther Bench and Cougar Mouth. A portion of Elk Pass, Panther Headwaters, Fish Knife and South Umpcoos MMMA's are within the basin.
- Coho salmon and steelhead trout in the West Fork Millicoma River, Fish, Panther, Kelly, Cougar, Elk, Hidden, Crane, and Skunk Creeks.
- Opportunities for in-stream habitat restoration (West Fork Millicoma River, Fish, Panther, Kelly, Cougar, Elk, Hidden, Crane, and Skunk Creeks).
- Land use classifications include Focused-Visual in several locations along upper West Fork Millicoma River and along Elk Creek. Other features worthy of protection consideration include the Cougar Pass Lookout situated at the 7000/7700 road junction the microwave relay station located on Elk Peak on the 1720 road both classified as Special-Administrative Sites.

Proposed Management Activities

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

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

Stream enhancement Projects—Many projects have been conducted over the past 10 years to restore and improve salmon habitat on the West Fork Millicoma River and on the Cougar, Fish, Kelly, Elk, Panther, Skunk, Hidden, and Crane Creeks. These include large wood placement, rootwad placement, fish passage improvements, vacating roads and closures, and

voluntary riparian tree retention. According to the watershed analysis, Cougar Creek and the West Fork Millicoma have moderate to low levels of existing large wood.

Recreation—Recreation in this basin is mostly dispersed hunting and camping. Campsites along the upper West Fork Millicoma River and Elk Creek are frequently used by hunters and recreationists. The basin will retain its qualities for dispersed recreation potential.

Basin 12—Trout Deer

This approximately 11,316-acre management basin is the largest basin on the ESF, located in the Coos watershed. Approximately 83 percent of the basin is located in Coos County, with the northern part in Douglas County. Forests in this management basin are typical of the ESF, composed of a mix of age structures from Early to Advanced. 184 acres are classified as Special-Visual, Special-Recreation, and Special-Operationally Limited, and a progeny research study area. The 7-acre Elkhorn Ranch is a private in-holding along the West Fork Millicoma River.

Conservation acres in this basin include twelve MMMA's, portions of owl circles, SUV's and RMA's. Seven of the MMMA's are located entirely within the basin, and four are shared with adjoining basins. There is one active owl centers located in this basin.

This basin is situated in the middle reach of the West Fork Millicoma River. The major streams in this basin are West Fork Millicoma River and Trout, Beaver, Shake, Buck, Joe's, Otter, Deer, and Knife Creeks. No domestic water sources are located in this basin. This basin is entirely surrounded by state ownership.

The streams in this basin are prime spawning and rearing habitat for coho, steelhead, and cutthroat. Many projects have been conducted over the past 10 years to restore and improve salmon habitat on the West Fork Millicoma River and Joe's, Otter, Deer, and Knife Creeks. These include large wood placement, rootwad placement, fish passage improvements, road vacation (Deer Creek and Knife Creek Roads) and closures, and riparian tree retention.

Recreation—In this basin, recreation consists mostly of dispersed hunting and camping. Unimproved campsites along the middle reaches of the West Fork Millicoma River are frequently used by hunters and recreationists.

Key Resource Considerations

- Northern spotted owls: Upper Millicoma Pair Site.
- Marbled murrelets: Elkhorn Ranch, Millicoma Strawberry, Joe Buck, Millicoma Connect, Knife Point, Knife Forks and Dear Molar. Portions of Beaver Headwaters, Fish Knife, Deer Confluence and Big Deer MMMA's are in the basin,
- Coho salmon, and steelhead trout in West Fork Millicoma River and in Trout, Beaver, Shake, Buck, Joe's, Otter, Deer, and Knife Creeks.
- Opportunities for in-stream restoration (West Fork Millicoma River and Trout, Beaver, Shake, Buck, Joe's, Otter, Deer, and Knife Creeks).
- Land use classifications include Focused Visual, concentrated primarily along the 8100 road and 8000 roads adjacent to the West Fork Millicoma River. There is also a progeny

tree research area along the 7300 road. Other noteworthy features include multiple low-water crossings across the West Fork Millicoma River along the 8100 road, and a weather station along the 9360 road just west of Elkhorn Ridge.

Proposed Management Activities

Harvest – Harvest opportunities in this basin are high. The majority of harvest opportunities during this planning period will be regeneration harvests.

Transportation – This basin is a medium priority for planning and/or investments in the infrastructure. Road construction will be mostly short spurs, road improvement will be at a similar rate than the last ten years.

Stream Enhancement Projects—According to the watershed analysis, the West Fork Millicoma River and Deer, Otter, Joe's, Trout, Buck, and Shake Creeks have moderate to low levels of existing large wood.

Recreation—The basin will retain its qualities for dispersed recreation potential. There are no plans at this time for expansion or improvement of the Elkhorn Ranch camp area.

Basin 13—Ash Valley

This approximately 4132-acre management basin is located in the Umpqua watershed in Coos and Douglas Counties.

The Ash Valley management basin is located in the southeastern corner of the forest. Stands in this basin are typical of the ESF, composed of a mix of age structures from Early to Advanced. This basin has several areas that fall under special land use classifications, including Special- Operationally limited due to public safety concerns, Focused-Visual. The Ash Valley management basin shares an eastern and southern boundary with the BLM, private landowners, and industrial forestland owners.

Conservation areas in this basin include three MMMA's, portions of owl circles, SUV's and RMA's. One MMMA is located entirely within the basin and the other is shared with Basin 11. There is also one active bald eagle nest site located along Loon Lake. There is one owl center within the basin.

The major creeks in the Ash Valley management basin are Little Salander Creek, Salander Creek, Baker Creek, and Bickford Creek. These creeks and other small tributaries drain either into Loon Lake or Lake Creek, both of which are located just to the east of the ESF boundary. One domestic water source is located within this basin, in the Ash Valley School tract. Several other water sources (domestic and irrigation) are located just outside the forest boundary.

Because of both a gradient barrier on Mill Creek and an additional natural fish passage barrier near the north outlet of Loon Lake, the streams of the Ash Valley management basin do not contain anadromous fish. Instead, resident cutthroat trout are the primary stream inhabitants.

Key Resource Considerations

- Northern spotted owl (Salander Creek resident single site).
- Marbled murrelets: All of Crystal, Salander Loon and a portion of South Umpcoos MMMA's.
- No salmon or steelhead are present in this basin. Resident cutthroat trout are present in Salander, Little Salander, Lake, and Bickford Creeks.
- Bald eagle nest site (Loon Lake).
- There are no opportunities for in-stream habitat restoration for salmon or steelhead.
- Potential visual impacts from Loon Lake and the recreation area.
- Hardwood stand in this basin within the SUV

Proposed Management Activities

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

Transportation – This basin is a medium priority for planning and/or investments in the infrastructure. Road construction will be mostly short spurs, road improvement will be at a similar rate than the last ten years.

Stream Enhancement Projects —There are no immediate plans to conduct stream enhancement projects in this basin. No streams in the Ash Valley management basin have been targeted for future stream restoration projects.

Recreation—Recreation in the Ash Valley management basin is typically centered on the BLM Loon Lake Recreation Area, which is adjacent to the northern boundary of this basin. This area and basin provide opportunities for camping, hiking, boating, swimming, and fishing. Additionally, dispersed camping sites exist along Douglas County Road #3. Hunting opportunities also exist within this basin. The basin will retain its qualities for dispersed recreation potential.

Basin 14—Scattered Tracts

This approximately 2,270 acre management basin is located in Coos, Douglas, and Curry Counties. Forests in the scattered tracts range from typical coast range Douglas-fir to Sitka spruce stands, knobcone pine stands, and redwood. These lands are unique to Coos District in several ways: 1) they are widely scattered, and 2) they are 100% Common School Land ownership.

The scattered tracts contain most of the land in the district designated as Non-Silviculturally Capable (NSC). The scattered tracts share boundaries with a variety of landowners, including the BLM, USFS, private industrial forestland, and other private landowners.

Several of the tracts have spotted owls on or within 1.5 miles of state ownership. One is known to have marbled murrelets. Some have significant wetlands, native grass prairies, and possibly California pitcher plants.

The major streams in the scattered tracts are Elliott, Tom Folley, North Fork Floras, Buzzard Butte Canyon, West Fork Cow, Salmon, and Iron Creeks. Some of these streams contain coho salmon and steelhead, while others likely have only resident populations of cutthroat trout.

Key Resource Considerations

- Northern spotted owls. Several of the tracts are within 1.5 miles of known spotted owl sites, and one contains the Barrett pair site (Rice Creek tract).
- No marbled murrelet surveys have been conducted on the scattered tracts. Murrelet use is unknown at this time, but is likely in some locations. Surveys by an adjacent landowner (Green Diamond) have documented murrelet use on the Winchuck tract.
- Coho salmon and steelhead trout in Tom Folley Creek, and possibly Elliott and Cedar Creeks.
- Osprey nest sites less than one mile from property boundary.
- Possible location of California pitcher plant in Cedar Creek tract.
- Significant wetlands in South Slough tract.
- Native grass prairies in Carlton Creek tract. This tract is affected by a large deep seated earth-flow in the prairie and other portions of the tracts.

Proposed Management Activities

Harvest – Harvest opportunities in this basin are low. The majority of harvest opportunities during this planning period will be regeneration harvests. Several tracts may be scheduled for sale by the Department of State Lands.

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

Stream Enhancement Projects—Due to the dispersed nature of these tracts, the opportunities for stream enhancement projects are limited and will be assessed on a site-by-site basis.

Recreation—The scattered tracts will retain opportunities for dispersed recreation. Some of those with public access are likely used by hunters.

6. Expected Outputs and Habitat Achievements

The vision outlined in Chapter 3 of the FMP calls for the creation of a landscape with a broad range of forest structures and native tree species, and the promotion of structural diversity components within all stand types (e.g., snags and large down wood). While the forest maintains a general balance of structures, individual stands continuously change throughout time. This shifting mosaic of forest structures ensures the maintenance of healthy and vigorous stands, contributes to the diversity of plant communities and wildlife habitats, and enhances overall biodiversity throughout the forest. The mixture and arrangement of stand structures on the landscape is expected to provide connectivity between habitats within and across the forest.

Table 11 summarizes the current stand condition and the estimated post-IP stand condition for the ESF.

Table 11. Expected Outcome Post IP

	NSC	Early	Intermediate	Advanced Structure
Current Condition	<1%	5%	52%	43%
After IP Period ¹	<1%	12%	48%	40%

1. These estimates may differ from actual conditions at the end of 10 years due differences in location and timing of actual harvests.

Table 12 shows the annual partial cut and clearcut objective for the IP period. Table 13 shows the estimated annual habitat achievements for partial cuts and clearcuts based on the harvest objectives shown in Table 12. The district opportunity analysis, Appendix B provides further background on the process used to develop the harvest objectives.

Table 12. Annual Partial Cut and Clearcut Harvest Objectives, by Volume and Acres beginning January 1, 2012

Partial Cut		Clearcut		Total
Acres	MMBF	Acres	MMBF	MMBF
0-500	0-4	700-1000	35-45	35-45 ¹

1. The annual volume over the first 10 years is expected to average 40 MMBF.

Table 13. Estimated Annual Habitat Achievements for Partial Cuts and Clearcuts beginning January 1, 2012 .

Harvest Type	Snag Creation¹ (snags)	Down Wood Recruitment² (thousand cubic feet)	Green Tree Retention³ (trees)
Clearcut	350–500	210–600M	1400–4000
Partial Cut	0	0	NA

2. Snag Creation levels for clearcuts with average DBH is 20 inches DBH and larger—1 snag per 2 acres average over the AOP.
2. Down wood recruitment levels— Where operational feasibility, an average of 300 to 600 cubic feet per acre in clearcuts where stand average is 20 inches DBH and larger. In stands with a DBH less than 20 inches 3 to 6 logs per acre must be retained. This target is an average over the AOP.
3. Green tree retention level—average of 2-4 trees per acre a given AOP.

Table 14 shows the current and planned timber sale acres that may remain under contract after January 1, 2012.

Table 14. Summary of Current and Planned Timber Sales

Harvest Type	Clearcut Acres	Partial Cut Acres
Fiscal Year 2010	293	0
Fiscal Year 2011	572	0
Fiscal Year 2012	517	0

The AOPs for fiscal years 2010-2012 were approved prior to the final adoption of the 2011 FMP by the BOF. These operation plans also occurred prior to the time frame of this IP, although the contracts extend into the implementation period.

Expected Outcome (10 year)

The fourth map in the map section represents a potential outcome of advanced structure after 10 years of implementation under the Forest Management Plan. This map is generated from the forest modeling project and was developed with a number of assumptions: stationary owl circles, addition of a specified number of MMMA acres, application of current policies regarding owls, murrelets, riparian areas, and public safety areas. Due to the limits of modeling and new information is developed through the preparation of harvest operations and other management activities, this map will broadly represent the location of the stand structures, but the details may be somewhat different.

Research and Monitoring

The ESF Management Plan recognizes the need for adaptive approaches to management, in which the outcomes of management actions are measured and compared to stated objectives.

Changes in management activities or goals are made when necessary. This approach requires a commitment to long-term information gathering and the incorporation of that information into the decision-making process. The state forests research and monitoring program was developed to ensure that the levels of research, monitoring, and technology transfer are adequate to meet the information needs required by this long-range management plan. In spite of programmatic difficulties brought on by reduced budgets, ODF is committed to adapting management practices based on best available science.

Following approval of this Implementation Plan, a ten-year research and monitoring plan will be developed to guide research and monitoring activities in the planning area. This plan will be developed collaboratively with interested parties and will include opportunities for public input. The plan will:

- Describe the general monitoring issues that are anticipated to be addressed;
- Provide the framework to aid prioritizing and developing specific monitoring projects to assess the effectiveness of the management strategies;
- Guide development of annual operations plans to support monitoring projects; and
- Describe funding mechanisms and how available funding will be prioritized among projects.

Additionally, the research and monitoring plan will support the following recommendations of the Oregon Global Warming Commission's "Interim Roadmap to 2020":

- Establish a carbon inventory for the Elliott State Forest;
- Establish baselines and calculate both long-term and intermediate outcomes for carbon storage based forest management strategies;
- Determine net effect of management activities on carbon stocks.

Appendix A. Elliott Stream Restoration Strategy

The Elliott Draft Forest Management Plan (FMP) establishes an Aquatic and Riparian Strategy for habitat restoration projects on State Forests. The FMP strategy describes several principles that provide the context and approach that State Forests will use for habitat restoration activities. The purpose of this document is to describe the overarching habitat restoration goals and how restoration activities will be prioritized and reported for the Elliott.

Habitat Restoration Approach

The overarching approach to habitat restoration is described under Strategy 5c to Maintain or Improve Aquatic Habitats (page 5-33 through 5-34) and summarized below:

- Eliminate human-induced conditions on the forest that may contribute to aquatic habitat deficiencies, or that may limit the timely recovery of desired aquatic habitat conditions.
- Promote aquatic habitat conditions that will support the short-term survival needs of depressed salmonids, in order to reduce the potential for further declines in these populations.
- Attain properly functioning aquatic habitat conditions in a timely manner.
- Encourage forest conditions that will support the ecological processes necessary to naturally create and maintain complex aquatic habitats on a self-sustaining basis.

Landscape and site-specific strategies will improve levels of aquatic function in the short term to meet the immediate habitat needs of depressed species and place aquatic habitats on a trajectory toward desired conditions. At the same time actions are carried out to restore the ecological processes and functions that create and maintain self-sustaining habitats over the long term. Restoration strategies include completing assessments to identify limiting factors and identify, design, and implement projects to remedy identified problems. Restoration projects should mimic natural process, use multidisciplinary approach, and consider site-specific as well as watershed scale processes and disturbance regimes. Projects will be designed to re-establish natural physical and biological processes.

Limiting factors have largely been identified in the ODFW conservation strategy, the 2005 State of Oregon Coastal Coho Assessment (OCCA) (State of Oregon 2005), and ODF Elliott Watershed Analyses. Therefore the task is to identify, design, and implement projects to address the limiting factors. This document is intended to address these elements of the restoration strategy for the Elliott by describing goals and priorities over the next 10 years.

Goals

Contribute to ecological benefits through stream habitat and water quality improvement.

The Elliott will implement restoration projects to improve aquatic habitat, riparian function, and water quality. The ecological value of potential projects will be evaluated using a “Restoration Screening Tool” described later in this Appendix (under “Ecological Benefits”).

There are several principles for evaluating ecological benefits established in the Coho Conservation Plan (2007) (OCCP). Examples that fit well with State Forest policies and information base include (but are not limited to):

- Conservation investments that achieve desired status goal for coho ESU.
- Work that supports remediation of population-scale limiting factors identified for coho populations in the 2005 OCCA.
- Work that is based on watershed assessments and limiting factor analysis conducted by local watershed conservation entities (or others) at scales finer than the population-scale limiting factors in the 2005 OCCA.
- Work that supports restoration of ecological processes rather than providing a short-term substitution for ecological processes.
- Work that supports conservation of multiple native fish and wildlife species.
- Work that supports maintenance or enhancement of life-history diversity in coho and other native fish and wildlife species.
- Work that supports conservation of unique or rare functioning habitats and habitat diversity.
- Work that capitalizes on time-sensitive opportunities (e.g., willing landowners, time-association with land-use action, etc.).
- Work that is likely to produce a large increase in productive capacity of coho salmon.

In the Coastal coho ESU: Projects will be implemented that contribute to measureable restoration goals established for coho in the OCCP (Table A) with a priority to work in streams/watersheds with high to moderate intrinsic potential for coho or steelhead.

Table A-1. Goals for the amount of high quality habitat in each independent coho population in the Oregon Coast Coho Evolutionary Significant Unit. Watersheds displayed in this table include the Elliott State Forest, but also include a high percent of other ownerships. (Source: Oregon Coast Coho Conservation Plan Appendix 2 page 21)

Population Unit	High Quality Habitat Miles			
	Total Needed	Current	Additional	Current % of Total Needed
Lower Umpqua	306	110	195	36%
Coos	233	175	58	75%

- ¹ Spawner goal @ 1.1% marine survival (Table 2) divided by 0.03/0.011.
- ² Spawner goal @ 3% marine survival. 15% is maximum allowable harvest rate under Amendment 13 during periods of 3% marine survival.
- ³ The average number of spawner observed during years with a 3% marine survival rate from 1990 to 2003.
- ⁴ Observed spawners @3% marine survival.
- ⁵ The adult recruit goal divided by 0.03 (marine survival) to obtain an estimate of the number of smolts needed. The number of smolts needed was then divided by 2,800 (smolts/mile produced by HQ habitat -based on Nickelson 1998).
- ⁶ The observed recruits divided by 0.03 (marine survival) to obtain an estimate of the number of smolts needed. The number of smolts needed was then divided by 2,800 (smolts/mile produced by HQ habitat -based on Nickelson 1998).
- ⁷ Total miles high quality habitat needed – current miles high quality habitat

Number of Habitat Restoration Projects

Projects can be implemented *opportunistically* (when operating near streams that would benefit from restoration efforts) or with a *cooperative* approach both of which will be evaluated for ecological benefits. This approach is consistent with findings from the Elliott Watershed Analysis. For the Elliott the goals are to:

- Implement 2-5 collaborative projects over a 10-year period if resources and partners are available.
- Implement 2-3 opportunistic projects per year if resources and partners are available.
- Contribute to fish passage improvement and hydrologic disconnection.

Elliott Priorities

The principles for prioritizing habitat restoration projects on the Elliott are as follows:

- Prioritize projects for the best benefit to endangered species
- Prioritize projects that are most cost effective and efficient

The following project types are in order of priority assuming all else is equal. An exception to priorities may occur when projects can be implemented with high efficiency or if the “Restoration Screening Tool” suggests that for a given watershed there is a different order of priorities. For The Elliott the overarching priorities are:

1. Fish Passage: This is considered the highest priority when passage project improves or provides access to (a) greater than ¼ mile of habitat and/or (b) high or moderate intrinsic potential for coho (CLAMS), or high priority restoration reaches for steelhead or Chinook.
2. Road Decommission or Hydrologic Disconnection: Hydrologic disconnection is important for all roads (i.e. including roads with connectivity to Type N or Type F streams) to reduce impacts on water quality. Decommission roads with the following characteristics:
 - a. Stream side roads: roads parallel and within 100 feet of Type F streams
 - b. Roads with significant stream crossing blow-out potential.
 - c. Roads with many Type F stream crossings.

Road decommissioning around Type N streams may be a lower priority than instream habitat projects (below). For The Elliott, most roads around small Type N streams are compliant with the Roads Manual. However, The Elliott Watershed Analysis identified the following road improvement opportunities:

Road Improvement Opportunities from Elliott Watershed Analysis:

The Elliott Watershed Analysis identified several road upgrade projects some of which have been implemented. We will evaluate what has been done and establish priorities for work that remains to be done. The Watershed Analysis identified the following roads for upgrading ditch relief culverts (diameter, spacing, and discharge points) to meet current best management practices:

- 1000 Road along Marlow Creek (Millicoma R. 5th field)
- 2300 Road along Trout and Beaver Creeks (Millicoma R. 5th field)

- 5000 Road along Scholfield Ridge (Lower Umpqua R. 5th field)
- 6000 Road along Charlotte Ridge (Lower Umpqua R. 5th field)
- 8000 Road along the W.F. Millicoma River (Millicoma R. 5th field)
- 9000 Road along Elk Creek (Millicoma R. 5th field)

Upgrading due to legacy construction techniques:

- 0400 Road along Puckett Creek (Mill Creek 5th field)
- 2000 Road on Allegany side around the 2.0- to 2.5-mile markers
- 3000 Road along Sullivan Ridge
- 3300 Road along Daggett Creek
- 3400 Road along Larson Ridge
- 3500 Road above Palouse Creek
- 7400 Road along Fish Creek (WF Millicoma 5th field)
- 7500 Road along Footlog Creek (Mill Creek 5th field)

Consideration for closure and/or relocation:

- 0100 Road along Charlotte Creek (Lower Umpqua 5th field)
- 0200 Road along Luder Creek (Lower Umpqua 5th field)
- 0900 Road along Johanneson Creek (Lower Umpqua 5th field)
- 7600 Road along Cougar Creek (WF Millicoma 5th field)
- 8100 Road along the W.F. Millicoma River (W.F. Millicoma 5th field)

3. Instream Habitat Projects (wood placement, boulders, etc.): The FMP states that a priority will be placed on projects that supplement natural “legacy” elements (large woody debris) that are lacking due to previous disturbance events, and/or management activities. An emphasis will be placed on projects that re-introduce large “key” pieces of wood to channels in natural configurations. Projects will maximize the functional attributes of large woody material, and minimize potential conflicts with public safety in downstream reaches. A priority will be placed on streams with salmon or steelhead habitat. Where data are available (Coast coho ESU), the highest priority will be to work in areas of “high intrinsic potential” for coho (CLAMS 2005).

The Elliott Watershed Analysis suggested a focus on streams less than 40 feet wide, with riparian areas that lack conifers.

4. Alternative Plans to Manage Riparian Areas: These projects will promote the desired condition for riparian areas (MFC or Complex Structure). Such projects will not be carried out in areas with beaver presence unless plantings can be adequately protected against beaver damage.

The Elliott Watershed Analysis emphasized the importance of riparian conifers for long term improvements to large wood loading in streams.

5. Beaver: Beaver will be allowed to persist (i.e. not be trapped or moved out of streams) and beaver dams will not be destroyed (FPA OAR 629-660-0050).

Exceptions include:

- a. Beaver pose a risk to stream crossings that cannot be managed with alterations to the crossing.
- b. Beaver pose a risk to plantation.

Under these exception conditions:

- a. A written plan will be submitted to the District Forester prior to the removal
- b. Relocation following ODFW relocation guidelines (ODFW 2010) will be considered.

Rationale for Priorities:

1. Fish Passage: No matter how good the habitat quality, if fish can't access it, there is little benefit. So a priority is placed on fish passage. Exception: if the projects do not access sufficient or important habitat, other habitat restoration projects may be a higher priority. Placing road work as a priority is consistent with the FMP principle to "eliminate human-induced conditions on the forest that may contribute to aquatic habitat deficiencies".
2. Road Decommissioning or Hydrologically Disconnecting Roads: Roads have the potential to chronically and episodically impact water quality and stream habitat more than any other forest activity. Therefore a priority is placed on decommissioning roads within the context of a transportation plan. Hydrologic connectivity is a Performance Measure and disconnecting roads reduces potential for road-sediment to get in streams. Placing road work as a priority is consistent with the FMP principle to "eliminate human-induced conditions on the forest that may contribute to aquatic habitat deficiencies".
3. Instream Habitat Projects: Nearly all streams throughout the Coast range have low levels of large wood. Large wood provides complex habitat for fish – a limiting factor identified in the coho habitat restoration plan (OCCP 2007).
4. Alternate Plans to Manage Riparian Areas: are an important tool for shifting riparian conditions to a desirable trajectory that will provide large wood recruitment to streams and ultimately replace the need for stream enhancement projects. This is placed as a lower priority because of challenges with successfully achieving reforestation near streams. Typically problems include: creating enough light (large enough opening in the overstory canopy) for the seedlings while minimizing potential negative effects on stream temperature and wood

recruitment, controlling weed and brush competition near streams where the usual control tools are more restricted, and overcoming elk and beaver damage. The Elliott District has some current examples of where the Alternative Vegetation Plans are being implemented. Outcomes from these projects will help guide future use of Alternative Vegetation Plans.

5. **Beaver:** Currently State Forests is taking a passive approach to beaver colonization. We are not actively reintroducing beaver but we will make every attempt not to interfere with existing beaver and beaver activities. Beaver influence on streams provides key habitat conditions to support recovery of listed fish.

Ecological Benefits: Restoration Screening Tool

The ecological value of restoration projects can be weighed against several existing information sources. The information sources will be compiled in a “Restoration Screening Tool GIS Database” (under development). The ODF Aquatic Specialist and Elliott Wildlife Biologist will review the screening tool when opportunistic (i.e. during the AOP process) or cooperative projects are being considered. This database will compile information from several sources including: Fish habitat distribution (ODFW 2010b); stream size and fish distribution (ODF GIS Data); stream gradient and width; Intrinsic Potential for Coastal coho (CLAMS 2005); road crossings, road segments, and stream reaches identified as good opportunities for restoration in ODF Elliott Watershed Analysis (Biosystems 2003) and ODFW Aquatic Inventory Assessments (ODFW 2005); and OCCP measurable criteria for coho recovery. The Restoration Screening Tool may eventually be adapted to track beaver-related information and restoration accomplishments.

Opportunistic Projects: Projects Associated with Timber Sales

By their nature these are not identified in advance of annual operations plans. These projects may not necessarily follow priorities established above. This allowance is made because these projects are typically a highly efficient means to improve the quality of aquatic habitat because the operation includes harvest mechanisms or proximity to streams that facilitate efficient (high benefit to habitat: low cost) implementation. Guiding principles for implementation of habitat restoration projects associated with timber sales include but are not limited to one or more of the following:

- Good access to stream (e.g. either cable over stream or road/tractor ground near stream).
- Trees of sufficient size (meet ODFW diameter and length criteria) or with root wad attached are available in the harvest area.
- Operation is adjacent to a salmon or steelhead stream.
- Operation is adjacent to stream with an active channel width between 10 and 20 feet. Wider channels may work, but are more challenging because of the length of wood required (2 X channel width). Projects in narrower channels can work as well, but are considered a lower priority-especially if the stream is steep and only contains cutthroat trout.
- Personnel are available to administer implementation of the project.
- Address 1 or more of the habitat restoration priorities.

Cooperative Projects: Planned outside of Timber Sales

In addition to meeting ecological priorities, these projects will have substantial community support and collaboration. These projects can be filtered through the Restoration Screening Tool and weighed against the established priorities for the district. The Watershed Council Coordinator, Elliott Biologist, and/or local ODFW Habitat Biologist typically will provide leadership in the design, grant requests, and implementation of these projects.

Measure of Accomplishment

The Aquatic Specialist will report progress towards habitat restoration goals using the following metrics:

- Number of projects
 - By type (e.g. barrier removal, hydrologic disconnection, decommission, wood placement, etc.)
- Miles of stream or roads treated or habitat made accessible
 - By type
 - By 5th Field HUC
- Number of miles treated within salmon or steelhead habitat
 - Oregon Coast coho ESU this can be reported as miles of High IP and/or miles per watershed with measurable criteria established in the coho conservation plan.

Reporting System and Timeline

We will utilize Oregon Watershed Enhancement Board's (OWEB) existing habitat restoration reporting system.

- Annually (March): Projects will be reported to OWEB by [ODF/ODFW District Person].

The OWEB database will be queried by the ODF Aquatic Specialist to provide the following reports:

- Annually (August): Summary of annual accomplishments by district by project type for Division purposes.
- Biennially (August-or PM reporting time frame): Maps and narrative of accomplishments to date by watershed
- Annually (August) Establish an annual summary of accomplishments by district by watershed for the county report

Appendix B. District Opportunity Analysis

This Implementation Plan describes the current condition of the resources present on the district, conservation area management, and management activities for a 10 year period, including the Annual Harvest Objective (AHO). This opportunity analysis confirms that an average volume of 40 MMBF per year is achievable and determines the mix of clearcut and partial cut harvest to achieve the objective. This appendix describes the *Opportunity Analysis* the district used to determine the AHO to achieve the strategies described in this Implementation Plan, the Elliott State Forest Management 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 acre ranges for clearcut 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 that could not be modeled because of a lack of data as well as factors that do not lend themselves to a computer model. 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 5 Annual Silvicultural Activities for Fiscal Years 2012 to 2021
- Table 12. Annual 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 Elliott Model Project. These models are designed to simultaneously achieve goals for timber harvest and maintain the stand structure outcomes consistent with the principles of Sustainable Forest Ecosystem Management described in the Elliott 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 by contacting the State Forests Operations Coordinator in Salem.

The harvest scheduling model for this opportunity analysis includes the following key elements:

- 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 (page 4);

- Incorporate the current spatial data available, including stand boundaries, locations of northern spotted owls and marbled murrelet management areas, and the current landscape design; and
- Revised yield tables developed from most current Stand Level Inventory data.

Harvest Context

Table 1 shows the harvest outputs from the model and the ranges determined using the District Opportunity Analysis. Table 2 shows the difference in average harvest volume per acre in the model versus the historic 5 year average.

Table 1. Harvest Outputs

	Model Outputs	Implementation Plan
Volume (MMBF)	45	35-45 ¹
Regeneration Harvest Acres	1030	700-1000
Partial Cut Harvest Acres	189	0-500
Total Acres	1219	700-1500

1. Average yearly volume for the 10 year period is expected to be 40 MMBF.

Table 2. Average Harvest Volume (MBF) per Acre

	Model ¹	Actual ²	Difference	Percent
Regeneration Harvest	41.9	52.7	9.9	8.1%
Partial Cut Harvest	10.3	6.8	3.5	33%

1. Average volume harvest per acre for the first two model periods of the I.P. Run

2. Based on the 5-year average volume harvested per acre using "cut out" or timber cruise information.

Factors Affecting Implementation

- Model clearcut volume per acre is 8.1% percent lower than cutout volume per acre from clearcuts completed in the last few years. The lower model volume per acre is because the model harvests some younger, lower volume stands that are inclusions in harvest units containing older, high volume stands. In practice, harvest units will be designed around these younger stands. This issue can be resolved in future modeling projects by refining the harvest unit boundaries and stand boundaries used in the model. The difference

between the model and actual harvest volume per acre will not affect the district's ability in implement the plan.

- Northern spotted owl locations have been assumed to be consistent in number and location for this model. Significant changes in the number or locations of the owls could have a significant impact on harvest levels.
- Marbled Murrelet Management Areas (MMMA) have been consistently increasing as a result of the annual surveys. In order to account for the likely increase in MMMA's, the model includes 8,500 acres of projected future MMMA's. This projected increase is based on the average acreage of new MMMA'S projected over 30 years. While there is still uncertainty regarding the actual number and location of occupied stands that will be identified through future surveys, the assumption of the additional MMMA's will allow the district to implement this plan.
- Helicopter Logging will likely be limited in the future by increased fuel costs. The uncertainty in Helicopter logging will not affect the district's ability to implement the plan at the 40 MMBF level.

Implementation

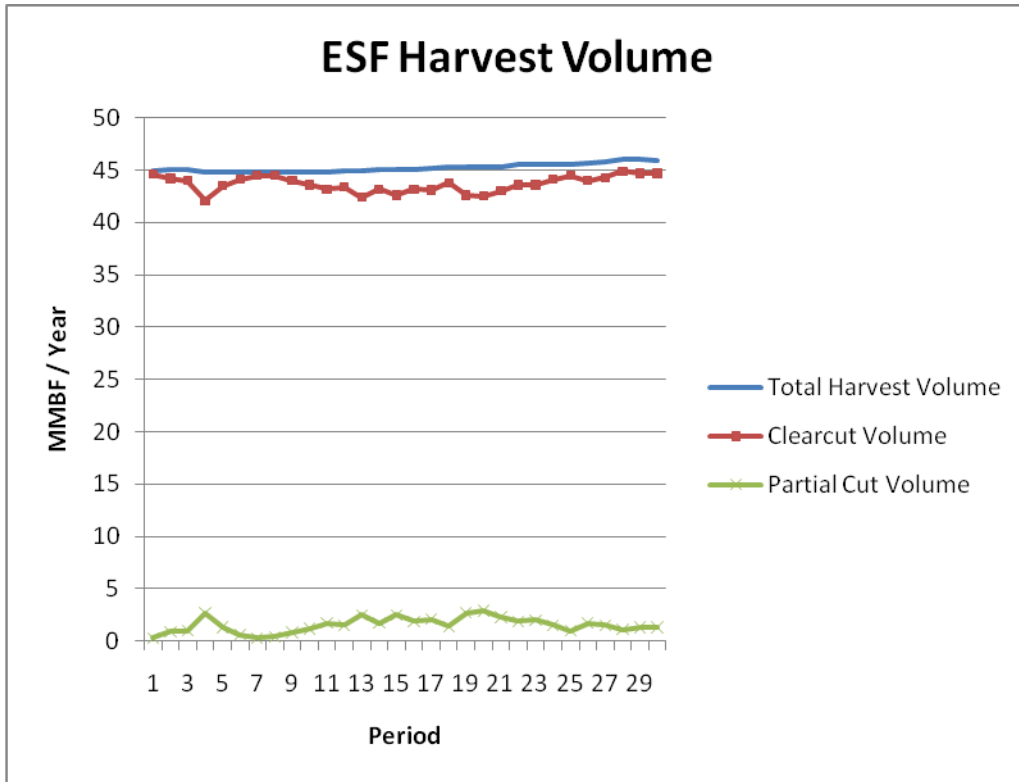
At 35-45 MMBF, the Annual Harvest Objective (AHO) is implementable. With the current economic situation the strategy to achieve this object will likely be more regeneration harvest and less partial cutting. The current acreage ranges for regeneration and partial cut harvest offer the flexibility to meet special situations, such as our current depressed economy. These ranges offer the flexibility in how we achieve the AHO while ensuring sustainable harvest due to the narrow range of the AHO.

- Volume: Noteworthy is the fact that for the first fifteen period's volume only fluctuates slightly between 45 and 46 MMBF and the first ten periods it fluctuates even less, between 45.6 and 45.8.
- Acres: The mid-point of the AHO clear cut acres is 850 which is lower than the model projection of 1030 acres. This difference is due to the inclusion of younger stands with less volume in the harvest units with older stands, in practice harvest units will be designed to include predominately mature stands.
- Thinning: The model outputs of volume/acre for partial cutting is 10.3 MBF/acre. This volume per acre amount is believed to be approximately 33% higher than what is anticipated from future harvest. In the near future more partial cutting will occur in younger stands (35 to 50 year age class) that will produce 6-7 MBF/acre.
- Basin 14-Scattered Tracts: Basin 14 was not included in the harvest schedule model. Approximately 200 acres may be available for clearcut in this IP period dependent on the status of owl circles.

Sustainability and Long Term Trends

The AHO is sustainable over the long term as shown by the charts below that represent the model outputs from years 0 through 80. Chart 1 shows the harvest volume by period slightly increasing through time with the majority of volume coming from clearcuts.

Chart 1 – ESF Harvest Volume¹



1 – This chart was derived from a model run with a 50 year age cap on thinning to more realistically portray the volume derived from thinning. A period is 5 years.

Chart 2 shows the total inventory increasing through time while the available inventory decreases as acres outside of reserves transition to a younger age class.

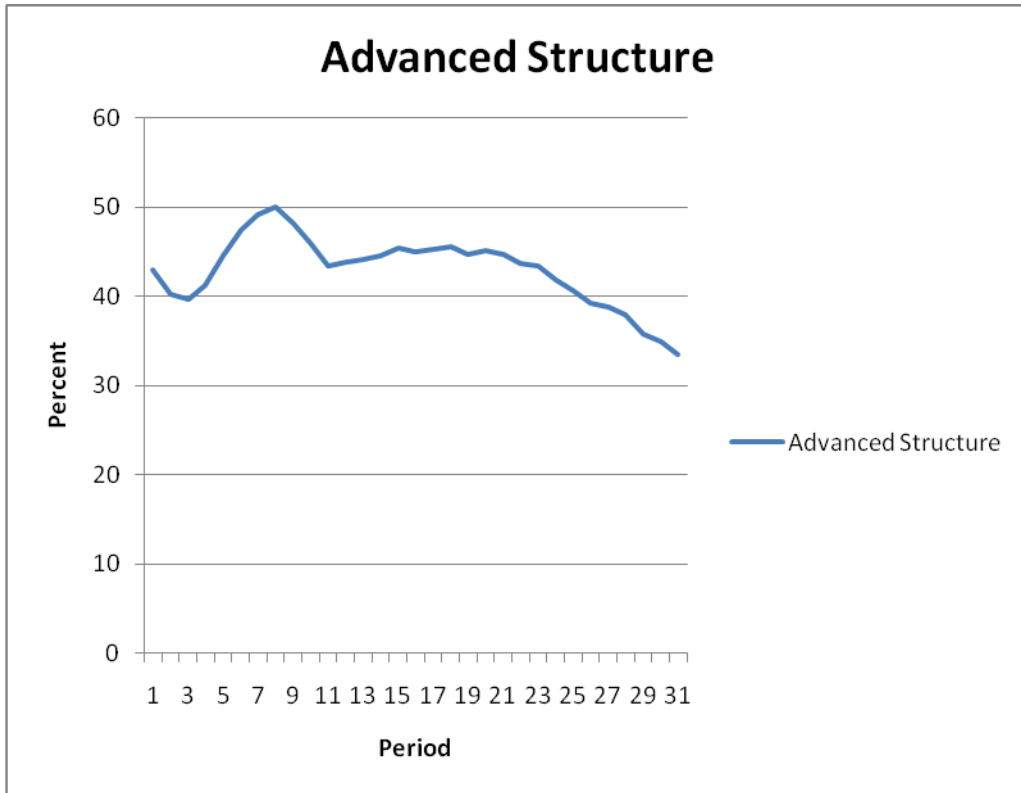
Chart 2 – Standing Inventory¹



1 - A period is 5 years.

Chart 3 shows an increase in advanced structure for the first 7 periods a decrease, then a leveling off before a final decrease. Structure outputs stay within the FMP targets.

Chart 3 – Advanced Structure¹



1 – A period is 5 years.

Appendix C. References

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Map Section

- 1. Coos District Ownership**
 - Elliott State Forest
 - Scattered Tracts

- 2. Coos District: Conservation Areas**
 - Elliott State Forest
 - Scattered Tracts

- 3. Coos District: Current Conditions**
 - Elliott State Forest
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- 4. Coos District: Expected Outcomes**
 - Elliott State Forest
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